SOUTHERN POWER AND INDUSTRY

MARCH, 1955

Presenting material that will help solve design, operating and maintenance problems that face engineers and executives of industrial plants and power plants in the South and Southwest.

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Alcoa at Mobile, Alabama

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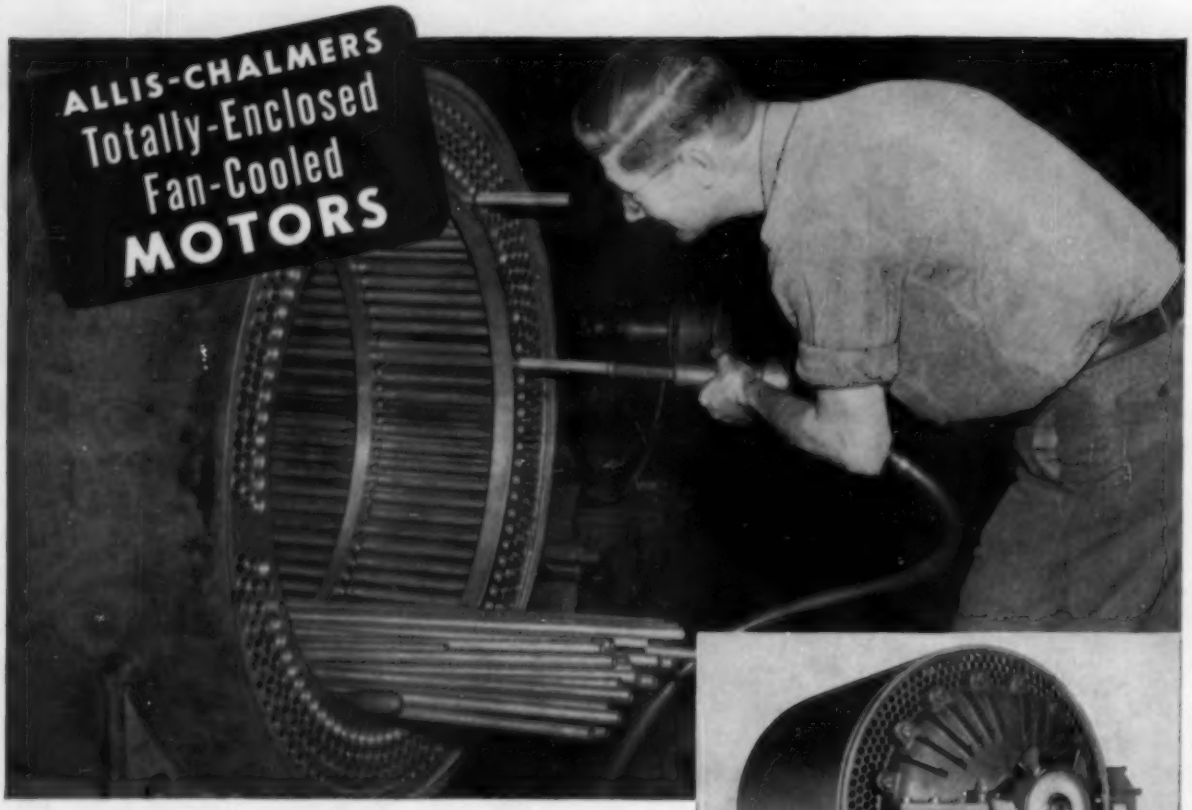

3600-rpm explosion-proof motor with fan housing removed to show unidirectional fan.

These heat exchanger tubes

Protect this motor from dirt and corrosion

COOLING AIR is carried through the heat exchanger tubes with sufficient velocity to expel practically all kinds of dirt. If oily or sticky dirt should cling, tubes can be ramrodded clean on the spot in a few minutes because tubes are straight and tube ends are exposed. Also, the tubes are distributed uniformly around the perimeter of the stator yoke and along its full length — cooling all parts of the motor evenly.

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You can lick corrosion with this motor, too. Tubes are available in a variety of materials to meet practically any corrosive atmospheric condition. Allis-Chalmers tube-type motors have long and successful experience in such difficult applications as caustic plants, refineries and petrochemical plants, power plants with fly ash problems and many others.

Get Complete Information

Next time you need a motor for a dirty or corrosive location or for outdoor operation in all kinds of weather, call your Allis-Chalmers District Office. Get complete information on Allis-Chalmers tube-type totally-enclosed, fan-cooled and explosion-proof motors. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 51B7149. Available in ratings on frames larger than NEMA 505 up to 3000 hp.

A-4559

ALLIS-CHALMERS

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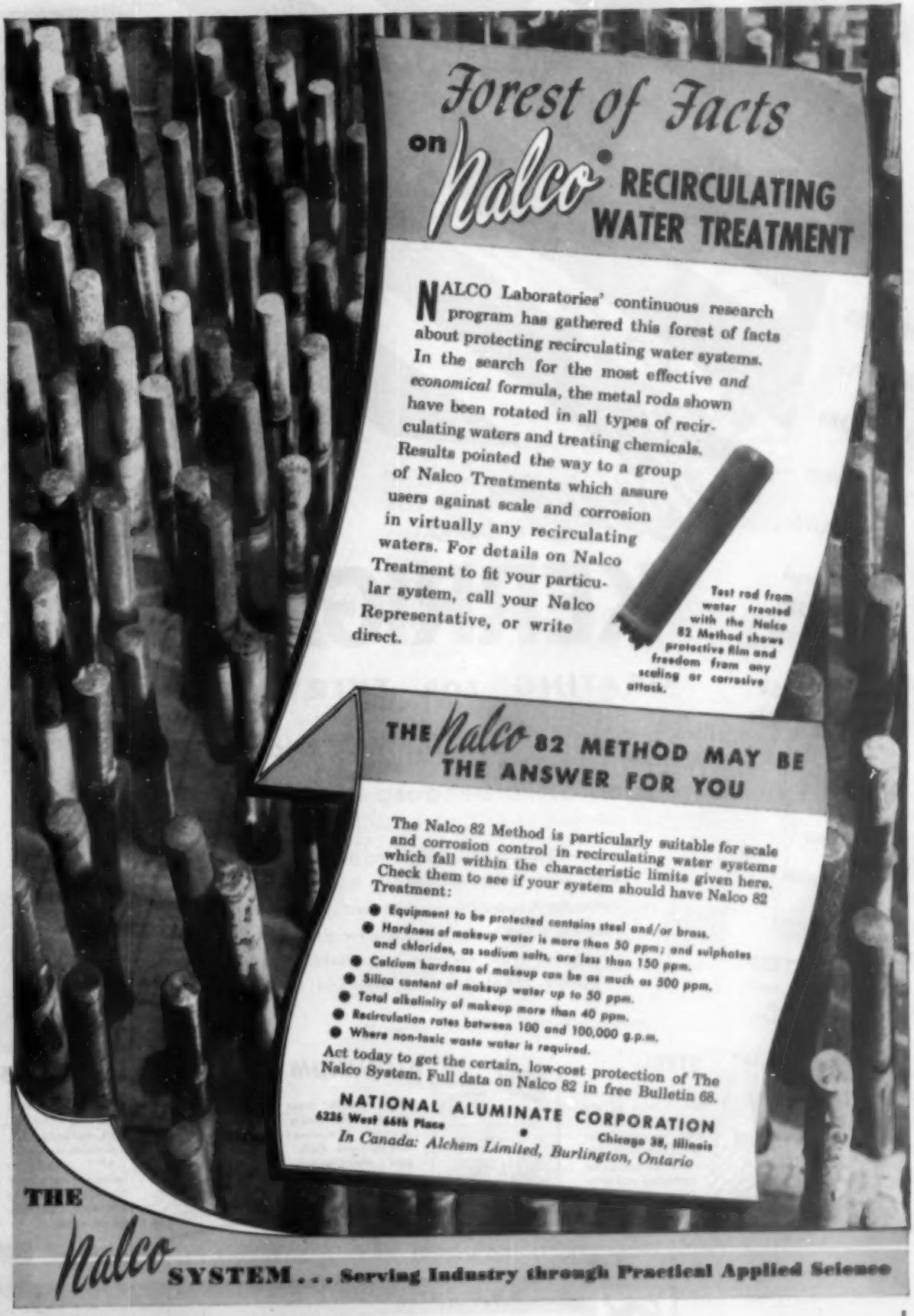
Forest of Facts
on Nalco RECIRCULATING WATER TREATMENT
NALCO Laboratories' continuous research program has gathered this forest of facts about protecting recirculating water systems. In the search for the most effective and economical formula, the metal rods shown have been rotated in all types of recirculating waters and treating chemicals. Results pointed the way to a group of Nalco Treatments which assure users against scale and corrosion in virtually any recirculating waters. For details on Nalco Treatment to fit your particular system, call your Nalco Representative, or write direct.
Test rod from water treated with the Nalco 82 Method shows protective film and freedom from any scaling or corrosive attack.
THE Nalco 82 METHOD MAY BE THE ANSWER FOR YOU
The Nalco 82 Method is particularly suitable for scale and corrosion control in recirculating water systems which fall within the characteristic limits given here. Check them to see if your system should have Nalco 82 Treatment:
Equipment to be protected contains steel and/or brass.
Hardness of makeup water is more than 50 ppm; and sulphates and chlorides, as sodium salts, are less than 150 ppm.
Calcium hardness of makeup can be as much as 500 ppm.
Silica content of makeup water up to 50 ppm.
Total alkalinity of makeup more than 40 ppm.
Recirculation rates between 100 and 100,000 g.p.m.
Where non-toxic waste water is required.
Act today to get the certain, low-cost protection of The Nalco System. Full data on Nalco 82 in free Bulletin 68.
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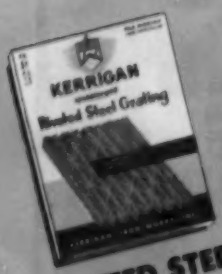

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SOUTHERN POWER AND INDUSTRY

Vol. 73
No. 3

MARCH
1955

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Facts and Trends

FOR SOUTHERN INDUSTRIAL AND POWER EXECUTIVES

March, 1955

► ALUMINUM PIPE FOR TEMPORARY SERVICE LINES--Recent Texas demonstration showed that aluminum pipe for temporary oil, gas and water lines can be installed and picked up about 10 times as fast as steel pipe of comparable dimensions. A mile of 2⅜" Reynolds' seamless, extruded aluminum pipe was handled by three men and one truck. Average stringing and coupling time--1½ hours; average upcoupling and unloading time--1½ hours. Total man hours--9 hours; total truck time--3 hours. Engineers estimate that it takes ten times that long to lay a mile of steel pipe.

Savings with the aluminum pipe result principally from lighter weight and speed in coupling and uncoupling. Special Quick Coupling (developed by Race & Race of Winterhaven, Florida) is welded to the ends of the pipe section to be joined, so that when the coupling is attached in the field, a leakproof fitting is achieved. Coupling contains a split "O" ring gasket on the inside, which seals when the coulping is latched in place.

► ONE OF THE HEAVIEST PIPE-BENDING JOBS ever handled was recently completed at the St. Louis headquarters plant of Midwest Piping Company where chrome-moly steel tubing of 3¾" wall thickness and 21" O.D. was bent 90 degrees. Steam piping is for the River Rouge Station of the Detroit Edison Company. Boiler capacity per unit will be 1,710,000 lb/hr produced at 2050 psi and 1050 F.

► ALABAMA POWER COMPANY'S Barry Steam Plant, about 23 miles north of Mobile, will be featured in the April issue of SP&I. Initial installation consists of two 125,000 kw units with provision for ultimate extension to 1,000,000 kw.

Semi-technical description, prepared by structural, electrical and mechanical engineers of Southern Services, Inc., will feature data on turbine generators, condensers and auxiliaries, steam generators, boiler auxiliaries, starting system and controls, steam temperature control, service water system, coal handling system, station electrical services, and fire protection. This will be supplemented by interior and exterior photos, heat balance and single-line electrical diagrams.

► SILICONE LUBRICANT, being tested by Westinghouse, exhibits outstanding thermal and load bearing properties. The fluid has satisfactorily passed thermal stability and viscometric tests ranging from -65 F to 500 F. Steel-to-steel bearing load tests have shown the fluid to have excellent lubricating qualities up to 107,000 psi bearing area.

► SP&I's 9th ANNUAL MAINTENANCE ISSUE will be coming to you in May featuring ideas, kinks, and procedures to reduce maintenance cost, save materials, and improve operation. Plant-tested procedures from Southern & Southwestern plants will cover piping and valves, buildings and equipment, materials handling equipment, refrigeration and air conditioning, power transmission, pumps and compressors, etc.

(Continued on page 6)

POWELL VALVES . . . THE COMPLETE QUALITY LINE . . . POWELL VALVES

POWELL STEEL VALVES

FIG. 11323—1500-Pound Motor Operated Steel Pressure Seal Gate Valve

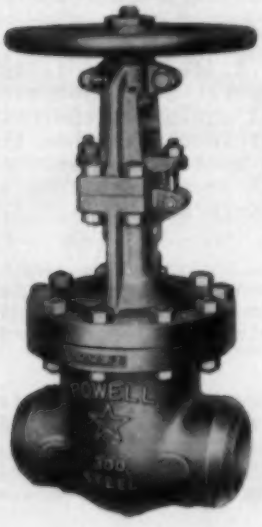


FIG. 3003 WE—Steel Gate Valve For 300 Pounds W.S.P.

FIG. 11365—Steel Pressure Seal Horizontal Lift Check Valve For 1500 Pounds W.S.P.

FIG. 1314-A—1500-Pound Integral Bonnet Steel "Y" Valve

POWELL VALVES . . . THE COMPLETE QUALITY LINE . . . POWELL VALVES

Wherever flow requires dependable control, there's the place for Powell Valves. Powell can supply just the valve you need, for Powell probably makes more kinds of valves and has solved more valve problems than any other organization in the world.

Shown above are just a few Powell Steel Valves. Investigate their many outstanding features . . . *and the complete line* of quality valves famous for dependable service.

Consult your Powell Valve distributor. If none is near you, we'll be pleased to tell you about our complete line, and help solve any flow control problem you may have. Write . .

The Wm. Powell Company, Cincinnati 22, Ohio . . . . . 109th year

facts and trends (continued from page 4)

► PLASTIC COATS FOR BUILDINGS--The new 15-story Carlton Hotel in Tyler, Texas, stands bright and shining with a smooth, jointless veneer of "Plastispray"--a vinyl plastic covering exhibiting excellent weatherproof properties.

The flexible, non-combustible skin, .030 to .035 in. thick, was sprayed directly on the concrete to form a continuous, jointless sheeting of 40,000 sq ft of area, eliminating all flashings, coping, facia and painting ordinarily used on such a structure.

In six weeks' time, 2 applicators, using 4 sprayers and 3 helpers, applied 1400 gallons of "Plastispray" at a cost of $16,000, enclosing the top 14 floors at an average cost of 40¢ per sq ft. Coating is considered a permanent material with 3 to 4 maintenance treatments required during the normal life span of a building.

► SELECTING WORK UNIFORMS?--With the vast number of different types of garments on the market, plant executives are often at a loss as to how to go about selecting the most practical kind for their particular needs. The Institute of Industrial Launderers, 1346 Conn. Ave., N.W., Washington, D. C., is offering help in the form of free consulting service to industrial and service plants. The Institute offers impartial advice as regulations prohibit the recommending of any specific uniform or its cleaning and maintenance by any specific company.

► ALL-PURPOSE WELDER DESIGN by Lincoln Electric is claimed to provide an ideal type of welding arc for every type of manual welding application, permitting selection of either a-c or d-c and either a soft or forceful arc. The Idealarc can be obtained as an a-c welder without the d-c current. To this unit a d-c package can be easily attached in about one hour whenever desired. It is also available as a combination a-c and d-c machine with selection of either current made through a twist of a switch handle.

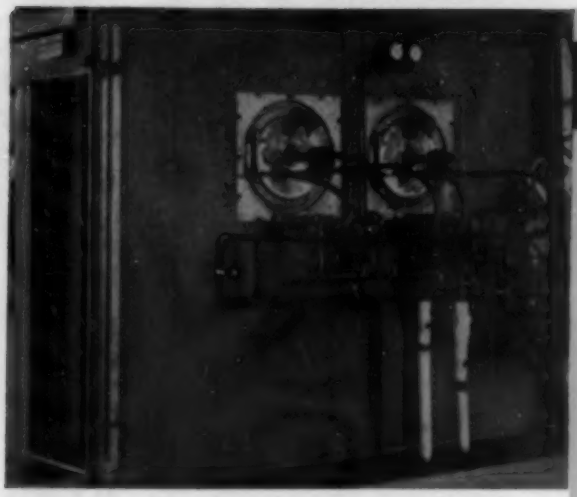
► MAGNET WIRE insulated with "Alkanex" (a recent G.E. development) is the toughest high-temperature film-insulated wire yet developed for use in motors, transformers, and other electrical equipment operating above 105 C. The thin-film, polyester-type of insulation has the ability to withstand "hot spot" temperatures up to 150 C and has outstanding physical, electrical, and thermal properties that will help to effect economies in the design of motors and similar equipment.

► ALUMINUM-SILICONE FINISHING SYSTEM for a high-heat painting application (mufflers and stacks on General Motors and Cooper Bessemer engines at Reynolds Metals' San Patricio reduction plant) is reported in this issue.

Stacks at the Corpus Christi, Texas, plant are about 1000 ft from open sea water, with the prevailing wind blowing off the bay. Engines operate intermittently and may be up or down at any time. Despite alternate heating and cooling, the exhaust stacks look almost as good as the day the coating was applied by the new method, over 2½ years ago.

R. D. Dill, plant engineer of the Corpus Christi, Texas, aluminum making facility, said: "This painting job has created considerable interest, especially among operators of diesel engines, and we have had numerous visitors to see this job. It is, I believe, rather remarkable, especially since many of the companies in this area consider a 90-day life on a similar paint job to be excellent."

Write the editors for additional information on any of the above items. SOUTHERN POWER & INDUSTRY. 806 Peachtree St., N.E. Atlanta 5, Ga.



ANNOUNCING...

The C-E La Mont Controlled Circulation Hot Water Boiler

for large heating and process applications

Combustion's high-temperature (H-T) water boiler is especially designed to utilize the inherent advantages of hot water over steam for large central heating installations and for many process applications. Units are available in sizes from 10,000,000 Btu per hour up, for any fuel, with pressures up to 300 psi and water temperatures to about 425 F. The chief advantages of the C-E La Mont Controlled Circulation Hot Water Boiler are:

Complete control – System control over the H-T water movement is extended to the boiler at all heat rates, since the water is under positive, controlled pressure.

Low pressure loss – Because of the low pressure loss inherent in the design, the system circulating pumps can be used to provide circulation through the boiler.

Pressurized operation – Used with oil or gas fired boilers, pressurized operation permits a simple stack arrangement and eliminates the need for induced draft fans.

Single-pass design – Absence of baffles not only assures low draft loss but also a cleaner boiler since there are no dead areas where deposits are likely to accumulate.

Other features – High furnace heat rates and more efficient heat transfer ... more efficient, closely spaced heating surface means reduced setting thickness, lighter boiler weight ... all boiler tubes are completely drainable ... small number of headers, all accessible from outside the completely steel-enclosed setting ... suitable for oil, gas or spreader stoker firing ... special designs available for other types of firing or waste heat.

In addition to these advantages, in many cases a C-E La Mont installation, as compared to steam, will result in a simpler and less expensive distribution system, and assure lower fuel and maintenance costs. Write for further information.

High-Temperature (H-T) Water has these important advantages...

HIGHER AVAILABLE HEATS are on tap. Many more Btu's are in a cubic foot of H-T water than in a cubic foot of steam at the same pressure. The greater storage volume, full of a higher Btu-carrying fluid, gives a heat reservoir from 40 to 100 times that of an equivalent steam system.

UNIFORM TEMPERATURE CONDITIONS prevail at all loads because water is circulated throughout the system under positive controlled pressure. In process plants, you can isolate special equipment for very fine temperature control, to produce a better product.

CLOSE CONTROL OF TEMPERATURE can be maintained either at the boiler or at individual pieces of equipment. Since temperature in the H-T water system need not be a direct function of system pressure, moderate adjustment does not affect boiler operation.

SIMPLIFIED BOILER OPERATION is a result of the system's inherent heat reservoir. This permits use of automatic controls of proved reliability.

HEAT LOSS IS MINOR since H-T water systems are usually fully closed, constantly circulating water back to the boiler with no condensate losses. Thus heat not used in process or heating returns to the boiler. This represents a fuel saving of 10-20% ... one that's more apparent the longer you operate the boiler.

NO ELABORATE FEEDWATER TREATMENT is needed. Since most H-T water systems are closed, full of water and free from air spaces, makeup requirements are a few gallons a day at most. Furthermore, there can be no active corrosion resulting from air-contact of wetted surfaces. These add up to substantially lower operating and maintenance expenses.

NO STEAM TRAPS which means the elimination of trap problems, maintenance costs and heat losses.

NO PIPING GRADIENTS are required, because there is no condensate drainage to consider. What's more, since the H-T water is under positive pressure, there is maximum flexibility in the arrangement of heating circuits.

TYPICAL APPLICATIONS OF H-T WATER

Space Heating	Calendar Rolls
Ovens	Heating Platens
Tanks	Hot Tables
Kettles	Snow Melting Coils

Cafeteria and Kitchen Apparatus

S-80AA

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- Conveyor Belts
- Power Transmission Equipment

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In Pittsburgh's Newest Housing Project...

274 miles

OF SPANG® CW STEEL PIPE

Complete gas, heating and waste systems at St. Clair Village served by SPANG CW

Modern housing developments in many parts of the city are providing wonderful, new low-rent homes for Pittsburghers as population increases and slum clearances create the need for more living quarters.

Recently completed is St. Clair Village, a 1,089-unit project on Pittsburgh's upper South Side. The Pittsburgh Housing Authority naturally wanted the best materials used in the construction of this development. So, to insure *top-quality* gas, heating and waste lines, 274 miles of SPANG CW Steel Pipe were installed to provide these important basic services throughout the entire project.

This is another example of SPANG CW acceptance as being a *top-quality* product. That's because SPANG CW Pipe is quality-controlled throughout its entire manufacturing process. Only *top-grade* steel is used . . . close control is maintained during forming . . . the finished pipe is doubly-inspected before shipment.

This special care gives SPANG CW that extra dividend that makes SPANG CW easier to cut, bend, thread and weld . . . gives you faster installation . . . keeps your costs lower . . . provides users with years of dependable top-quality service.

Take time next time you specify pipe . . . see your local SPANG Distributor and get SPANG CW Steel Pipe. Cash in on these SPANG benefits!

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General Sales Office: Two Gateway Center, Pittsburgh, Pa. District Sales Offices: Atlanta, Boston, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, St. Louis

NEWS *for the South and Southwest*

J. F. Pritchard Appoints Southern Representatives

J. F. PRITCHARD AND COMPANY OF CALIFORNIA, Kansas City, Missouri, manufacturer of cooling towers for industrial and air conditioning applications, has announced the appointment of Rittelmeyer and Company, Inc., and Brownlee-Morrow Engineering Company as new sales representatives in the South.

John M. Rittelmeyer

RITTELMEYER AND COMPANY, INC., of Atlanta, Georgia, represents J. F. Pritchard and Company of California in Georgia, Eastern Tennessee, and Eastern and Southern Florida.

JOHN M. RITTELMEYER started in business as a manufacturer's representative in Atlanta in 1925. Previously he worked as a turbine designer and erector and later engaged in sales work for Westinghouse. Rittelmeyer and Company, from its very beginning, has handled top quality accounts, and the careful policy of representing organizations of the highest reputation has inspired customer satisfaction and resulted in company growth through the years.

Today the organization is composed of: John M. Rittelmeyer, president; Donald M. McRae, sales manager; Michael A. Dailey, chief engineer; John L. Bridges, sales engineer; Howard W. Wheeler, sales engineer; John M. Rittelmeyer, Jr., student engineer; William B. Lawson, order department; and Mrs. Marion A. Hays, secretary. The Rittelmeyer organization occupies a modern, two-story, brick structure, completely air-conditioned and radiant-heated, in the business heart of Atlanta.

J. L. BROWNLEE and GORDON MORROW comprise the BROWNLEE-MORROW ENGINEERING COMPANY in Birmingham, Alabama, and represent J. F. Pritchard & Company of California in the State of Alabama, and the western tip of Florida.

The Brownlee-Morrow Engineering Company was organized in 1952 as a partnership and immediately began concentrating on Industrial Sales. The organization is well acquainted with consulting and industrial engineers in the area served, and works very closely with industrial plants in that vicinity.

Both Mr. Morrow and Mr. Brownlee are graduates of the University of Alabama and have gained wide experience in industrial heating, air conditioning, and ventilating engineering.

Houston Lighting & Power Continues Rapid Expansion

Rapid expansion of the area's generating and distribution facilities, with a total of $40 million having been invested in new equipment, was one of the major facts which emerged from HOUSTON LIGHTING & POWER COMPANY'S 1954 operating records.

Construction of new generating equipment at three of the company's plants went forward throughout the year. In June, 1954, the first unit at its new WEBSTER STATION was brought into operation. This was followed in December, 1954 by initial operation of the plant's second unit. The aggregate capacity of the two units, 230,000 kilowatts, is sufficient to supply the electric power requirements of a city having the combined populations of Fort Worth and Austin.

Simultaneously construction of a new unit—one of the Southwest's largest—was proceeding at the company's DEEPWATER PLANT. The huge new turbine-generator will more than double the plant's present capacity when it goes into operation in mid-1955. Meanwhile, other forces were at work at the company's new SAM BERTRON plant in the Houston Ship Channel area. Initial operation of this plant is scheduled for the Spring of 1956. The combined generating capacity of the four units completed and under construction is 560,000 kilowatts, which is more than two-and-a-half times the total amount the company had in 1940, after a half-century of operation.

Allis-Chalmers; Richmond

CHARLES W. PARKER, JR., has been named manager of the Richmond district of Allis-Chalmers general machinery division, according to an announcement by Frank R. Freyler, Mid-Atlantic region manager.

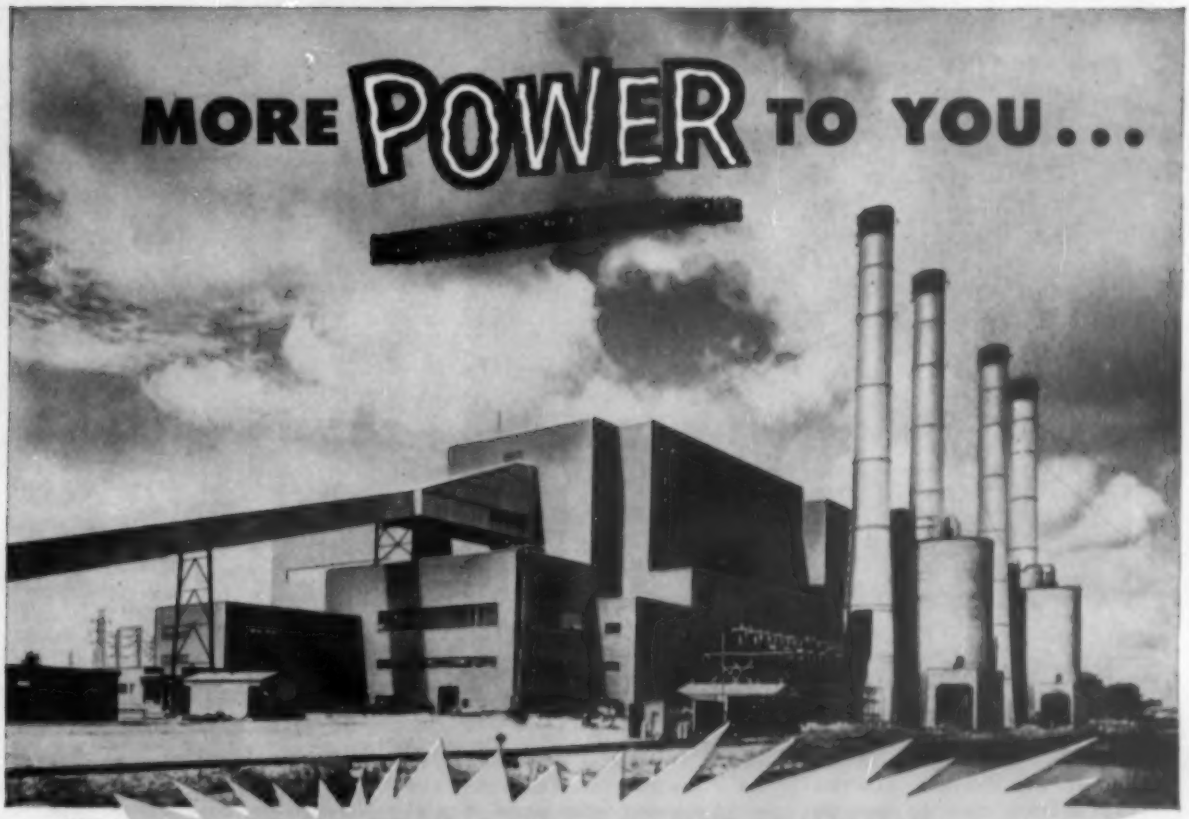
Parker, a representative in the Richmond office since 1948, succeeds Charles L. Crosby who died late last year.

Ben Juhan Now Manager of Kerrigan's Grating Div.

BEN H. JUHAN succeeds Art Drye as manager of the Grating Division of Kerrigan Iron Works, Inc., New York, Chicago, and Nashville, manufacturers of Weldforged Grating, Lighting Standards, Mast Arms and Brackets.

Ben H. Juhan

Mr. Juhan is a graduate of the University of Georgia and a former Captain in the U. S. Air Force. Before joining Kerrigan he was engaged in industrial management work with Tennessee Aircraft Corporation. Prior to that he was connected with Goodyear Tire & Rubber Company in their foreign comptroller's office; and in the Sales Department of Quaker Oats Company for three years.



Detroit Edison Plant boosts U.S. Electrical Capacity to 100,000,000 KW.

Detroit Edison's St. Clair plant boosts U. S. generating capacity to a new high. The latest St. Clair unit, rated at 156,250 kw., to go on the line brought the total U. S. electrical capacity to over 100 million kw. Shell Turbo Oil 27 was purchased as the lubricant for this unit as well as for the other three turbine generators in this plant.

Shell Oil Company extends heartiest congratulations to Detroit Edison Company for their part in achieving this industry milestone in electrical power.

Shell is proud of its long association with the great electrical industry.

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
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SHELL

New $20 Million G.E. Transformer Plant for N. C.

A new $20 million manufacturing plant, another major Southern expansion of the GENERAL ELECTRIC COMPANY'S Transformer Division facilities, will be constructed in the Hickory - Newton - Conover area of NORTH CAROLINA.

In the above photo JAMES L. ELROD, manager of marketing, and RAYMOND W. SMITH (at right), general manager of the company's distribution transformer department, are looking over an architect's drawing of the new plant.

The North Carolina plant will have all of the latest manufacturing techniques in its operation and will be highly mechanized. When completed in late 1956, the new plant will have about 400,000 sq ft of floor space with a single story factory building fronted by a completely air-conditioned office building. Employees will be hired from the local plant area except for less than 100 supervisors and specialists who will be transferred from Pittsfield.

Actual construction will begin early this year and hiring of personnel for the plant will not begin until 1956, according to current plans.

The new plant will be a completely self-contained manufacturing operation with present plans calling for the manufacture of pole type distribution transformers. However, the headquarters plant of the department will remain in Pittsfield.

ALEXANDER C. BOISSEAU has been named manager for the new $20,000,000 manufacturing plant. Mr. Boisseau is a native of Petersburg, Va., and a graduate of Washington and Lee University. He joined General Electric in Schenectady in January, 1929, as a member of the Engineering Training Program, then known as the Test Course.

In November, 1929, Mr. Boisseau was assigned to the Philadelphia plant of General Electric as an engineer in the Power Circuit Breaker Division where he worked on design and development problems, rising to the post of design engineer for the Air Circuit Breaker Division in December, 1942. His next promotion came in April, 1946, when he was named managing engineer of the same division.

In October, 1947, Mr. Boisseau became managing engineer of the Power Circuit Breaker Division and in August, 1949, managing engineer of the Panel and Equipment Division. He remained in this position until February, 1951, when he was appointed as assistant to the manager of manufacturing.

From November, 1951, to January, 1953, Mr. Boisseau worked on special assignment with the Gas Turbine Department in Schenectady. Following this he became manager of the Holyoke plant.

More News—Page 101

FUTURE EVENTS
Of Engineering Interest

NATIONAL ASSOCIATION OF CORROSION ENGINEERS, A. B. Campbell, Exec. Sec'y, 1061 M & M Building, Houston 2, Texas.
Mar. 7-11, Eleventh Annual Conference and Exhibition, Palmer House, Chicago, Ill.

AMERICAN POWER CONFERENCE, R. A. Budenholzer, Director, Illinois Institute of Technology, Technology Center, Chicago 16, Ill.
Mar. 30-Apr. 1, Seventeenth Annual Meeting, Sherman Hotel, Chicago, Ill.

NATURAL GASOLINE ASSOCIATION OF AMERICA, Wm. F. Lowe, Sec'y-Treas., 422 Kennedy Bldg., Tulsa 3, Okla.
Apr. 13-15, 34th Annual Convention, Baker and Adolphus Hotels, Dallas, Texas.

SOUTHERN SAFETY CONFERENCE, INC., W. L. Groth, Exec. Dir., P. O. Box 8927, Richmond 25, Va.
Feb. 27-Mar. 1, 16th Annual Conference and Exposition, Jung Hotel, New Orleans, La.

AMERICAN SOCIETY OF LUBRICATION ENGINEERS, W. F. Leonard, Sec'y, 343 S. Dearborn St., Chicago 4, Ill.
Apr. 13-15, Annual Meeting and Exhibit, Chicago, Ill.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, C. E. Davies, Sec'y, 29 West 39th St., New York, N. Y.
Apr. 18-21, Diamond Jubilee Spring Meeting, Lord Baltimore and Southern Hotels, Baltimore, Md.

NATIONAL MATERIALS HANDLING EXPOSITION, Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.
May 16-20, Exposition, International Amphitheatre, Chicago, Ill.

INDUSTRIAL MARKETING ASSOCIATES INC., John Paul Taylor, Exec. Sec'y, 520 Pleasant St., St. Joseph, Mich.
May 23-26, Annual Meeting, The Cloister, Sea Island, Georgia.

BASIC MATERIALS CONFERENCE AND EXPOSITION, Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.
May 31- June 3, Conference and Exposition, Philadelphia, Pa.

Whiting Corp. Establishes Charlotte District Office

WHITING CORPORATION, Harvey, Illinois, announces the establishment of a new district office in the Southeast to better serve the rapid increase of industrial activity in that section of the country. The office location is 1610 Liberty Life Bldg., CHARLOTTE 2, NORTH CAROLINA.

FRED W. FISHER has been appointed manager of this new sales office. He is a graduate of Purdue University (1940) and did post graduate work at Drexel Institute of Technology. For the past eight years Mr. Fisher has been in the Company's Philadelphia Office as a sales engineer. Assigned to Mr. Fisher's staff is HARVEY K. WATERS, formerly working out of Birmingham. Mr. Waters is a graduate of Michigan College of Mining and Technology (1949).

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Solvent Recovery Systems—Vacuum Stills and Filters

HYGRADE METAL FINISHING DIVISION

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Chemical Plating Equipment
Electrostatic Spray Painting Equipment
Paint Booths and Bake Ovens
Filters for Phosphate and Plating Solutions
Systems for Elimination of Stream Pollution
Pressure Vessels and Weldments for Process Industry

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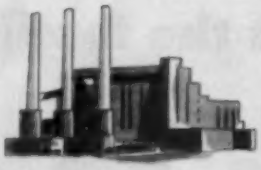
In the 267 new  **central station units being started in 40 different states during the 1953-56 period, 75% of the** **boilers will be equipped with Consolidated Maxiflow Safety Valves** **...35% will also have** **Consolidated Electromatic Relief Valves. These bulletins** **tell you why.**

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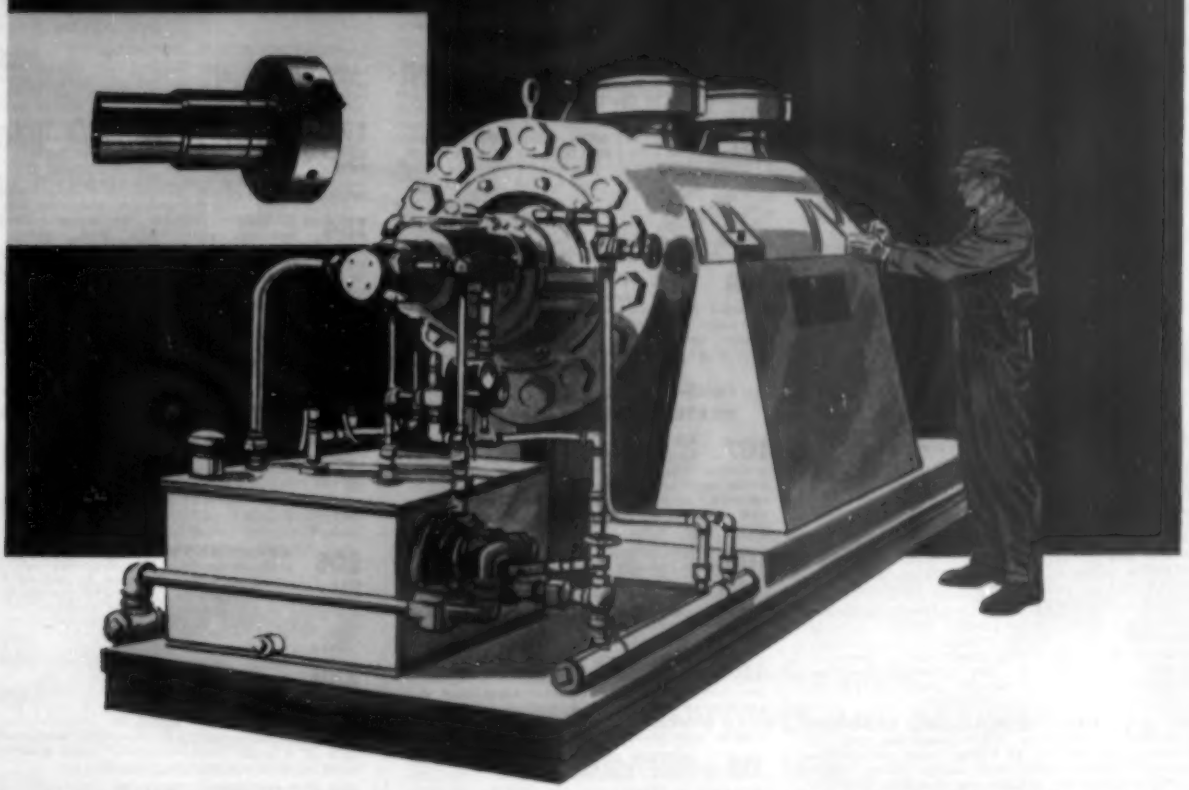

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STEAM TURBINES . . . FURNACES BOILERS, STOKERS, BURNERS

3 **AUTOMATIC SOOT BLOWING**—Bulletin 488, 16 pages—Gives basic information regarding Vulcan automatic and automatic-sequential soot blowing. Includes wide variety of typical installation drawings to show complete cleaning systems.—COPES-VULCAN DIVISION, CONTINENTAL FOUNDRY & MACHINE CO.

10 **SPREADER STOKER**—New Catalog — Describes the A-E perfect spreader stokers, featuring the answers to 14 basic questions essential to the choice and application of stokers.—AMERICAN ENGINEERING CO.

25 **DOUBLE-PASS BOILERS** — Bulletin 155—Gives complete specifications of a new double pass all-purpose industrial and heating boiler, "Southern made for Southern trade." Sizes from 44 to 155 hp S.B.I. with pressure up to 150 lb, designed for coal, gas or oil firing. This is a complete package double-pass unit, recently added to a regular line of single-pass firebox boilers manufactured since 1918.—LUCEY BOILER & MANUFACTURING CORP.

26 **OVER-FIRE JETS TO PREVENT SMOKE**—Technical Report No. VII, 24 pages, describes the application of over-fire jets to prevent smoke from stationary plants using coal—how to design, construct and install, and how to use.—BITUMINOUS COAL RESEARCH, INC.

39 **BOILER-BURNER UNIT**—Catalog 502 — Gives complete information about Kewanee-Petro boiler-burner matched unit for high or low pressure heating, power and process steam using oil, gas or combination oil-gas.—PETRO.

43 **LONG RETRACTABLE BLOWERS** —Bulletin 1002—Describes and illustrates the line of Vulcan long retractable soot blowers with dual motor drive. Both air and electric models are covered.—COPES-VULCAN DIVISION, CONTINENTAL FOUNDRY & MACHINE CO.

68 **OIL BURNERS FOR LIGHT OR HEAVY OIL** — Bulletin 65 — Describes National Airoil Type "LAP" oil burners to operate with light or heavy oil under manual or automatic control, using low air pressure for atomization. Wide firing range in each of seven sizes.—NATIONAL AIROIL BURNER COMPANY, INC.

72 **SINGLE RETORT UNIT TYPE STOKERS**—Bulletin 600, 28 pages —Describes a single retort, plunger feed, unit type stoker with individual full housed blower, 125 to 250 hp rated capacity, burning successfully all grades of coking or non-coking coals commercially known as nut, pea and slack, or crushed run-of-mine, without special coal preparation.—DETROIT STOKER CO.

76 **GAS BURNER** — Bulletin — Describes the Rectilinear gas burner, an application of the venturi principle which provides high input though narrow rectangular openings for firing — in a horizontal plane through fire doors or small openings over handfired coal grates or stokers — or for firing in a vertical plane on either side of stoker or oil burner.—THE WEBSTER ENGINEERING COMPANY.

80 **AUTOMATIC COAL STOKERS** — Form 4971—Describes the Iron Fireman commercial industrial stoker—a complete coal conveying and combustion system for heating and power boilers—modulated firing, which automatically adjusts coal and air-feed rate to the load.—IRON FIREMAN MFG. CO.

91 **ELECTRICAL PRECIPITATORS FOR COLLECTION OF SOLID AND LIQUID MATTER**—Booklet—Describes the various type and applications of Cottrell and electrical precipitators for the collection of solid and liquid matter suspended in hot or cold gases giving complete engineering data and installation illustrations.—WESTERN PRECIPITATION CORP.

98 **FUEL OIL TREATMENT**—Bulletin 50, 4 pages—Explains how Nalco SR-155 improves combustion and stops corrosion and sludge formation in fuel oil tanks, lines and equipment. — NATIONAL ALUMINATE CORP.

FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

107 **EXHAUST FANS**—Catalog 483—A helpful guide for engineers and executives interested in plant improvement—gives complete product information, specifications, typical installations, applications and accomplishments. — THE EMERSON ELECTRIC MFG. CO.

108 **RECIPROCATING COMPRESSOR** —Bulletin M-70, 44 pages—The M-Line multi-stage, multi-cylinder, 100 to 5000 hp, 250 to 514 rpm reciprocating compressors. Applications and installations illustrated with photographs and cut-away views.—THE COOPER-BESSEMER CORP.

110 **ATOMIZING DEAERATOR** — Publication 4160—Describes completely the 900,000 lb/hr Cochrane atomizing deaerator as applied in a leading oil refinery power plant—and the possibilities of this heater unit elsewhere.—COCHRANE CORP.

116 **MOTOR PUMPS FOR BULK STATION SERVICE**—Form 7281—Describes and illustrates this unit in its various applications with cross-sectional views and engineering data.—INGERSOLL-RAND CO.

128 **HOW TO SOLVE PUMPING PROBLEMS**—Booklet, 36 pages—Explains the functions and characteristics of Rotary gear pumps; sample application problems with charts and curves on pipe friction losses, viscosity conversion tables, materials of construction for various liquids, and additional information pertaining to pump applications.—GEO. D. ROPER CORPORATION.

155 **PROPORTIONING PUMPS**—Bulletin 52—Contains data on chemical feed packaged units made up of sturdy steel storage tank and high pressure low capacity proportioning pump—application and specification data.—THE BIRD-ARCHER COMPANY.

158 **SUBMERSIBLE PUMP** — Bulletin 51-5300, 4 pages—Describes and illustrates the "Bubette," a small submersible pump designed for low capacities at high heads, from wells six inches inside diameter and up.—BYRON JACKSON CO.

160 **BOILER FEED PUMPS**—Bulletin 109—Gives complete deails and application data on a wide variety of precision-built boiler feed pumps, with capacity from 100 to 2700 gpm and pressures up to 3000 psi—both split case and barrel types. Particularly helpful are charts determining vapor pressure and density of water at temperatures up to 550 F, etc.—PACIFIC PUMPS, INC.

176 **HEATER MAINTENANCE**—Bulletin IH-9 and Check Chart—Gives points to be checked in unit heater maintenance. Installation and maintenance procedures for Wing industrial heaters.—L. J. WING MFG. CO.

184 **PUMPS** — Bulletin, 24 pages — Describes centrifugal and piston pumps, and various allied equipment, designed and produced by an organization with half a century of experience in building pumps for all services.—CONDENSER SERVICE & ENGINEERING CO. INC.

INSTRUMENTS—METERS CONTROLS—REGULATORS

201 **FLOWMATIC BOILER FEED CONTROL**—Bulletin 1002, 12 pages—Gives applicational photos and detailed schematic drawings and charts. Relay and direct operation are covered. Case studies of representative boiler loads indicate stability of Flomatics in controlling feedwater automatically according to steam flow.—COPES-VULCAN DIVISION, CONTINENTAL FOUNDRY & MACHINE CO.

206 **PRESSURE TRANSMITTER** — Bulletin—Describes the Microsen pressure transmitter which is used to transmit pressure measurements from their source to a central point, through simple electric wiring.—MANNING, MAXWELL & MOORE, INC.

220 **DIAL THERMOMETERS**—Bulletin 255 describes a complete line of easy-to-read, vapor-pressure-actuated dial thermometers, available with rigid stem for use in pipe lines and tanks, or with flexible tubing for conveniently determining temperature at a point some distance from dial.—THE POWERS REGULATOR CO.

233 **CONTROL DRIVES** — Product Specification PSI-1 — Provides description, illustrations, ordering information, torque ranges, and dimensions of Bailey control drives for the positioning of regulating devices such as dampers, butterfly valves, rheostats. Actuated by pneumatic signals from automatic or remote manual control.—BAILEY METER COMPANY.

237 **GLASS SPECIALTIES** — Bulletin 10-1-51—Describes Ernst glass specialties—gage glasses, tubing, discs, plates, edge glasses, cutters, etc.—ERNST WATER COLUMN & GAGE CO.

257 **AUTOMATIC STEAM PRESSURE CONTROL**—Bulletin 462—Describes the Leslie pressure controller for supplying intermittent make-up to a low pressure system from a high pressure line—positive, faithful.—LESLIE COMPANY.

277 **WATER COLUMNS AND GAGES**—Bulletin WG-1811—Describes Hi-Lo alarm water column with vertical or "Sesure" inclined water gages. Complete details as to design, application and maintenance, with illustrations, and listing of applications.—YARNALL-WARING CO.

284 **PRESSURE CONTROLLERS**—Wizard Bulletin D-3—Describes the ingenious simple mechanism of Wizard controllers used to produce accuracy and dependability in pressure control — Bourdon tube for high pressure, bellows for low pressure.—FISHER GOVERNOR CO.

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305 **INDUSTRIAL HEATING** — Catalog 50, 50 pages—Gives data on the type and size of electric heating units and similar equipment for industrial heating needs. Detailed diagrams and photographs describe applications.—EDWIN L. WIEGAND CO.

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352 **ELECTRIC PRECIPITATORS** — Booklet — Describes the various types and applications of Cottrell electrical precipitators for the collection of solid and liquid matter suspended in hot or cold gases, with complete engineering data and illustrations.—WESTERN PRECIPITATION CORP.

368 **WROUGHT IRON**—"101 Uses for Wrought Iron"—Gives a brief comprehensive review of why, how and where wrought iron is used, coupled with a discussion of its economic justification.—A. M. BYERS COMPANY.

PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS

407 **VALVES OF ALL KINDS, SCREWED, WELDED, FLANGED, GATE, CHECK, GLOBE REGULATOR, RELIEF**—General Catalog—Gives a complete picture of the complete line of Crane valves for power industrial and service plant applications.—CRANE CO.

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418 **PIPING EQUIPMENT**—Catalog 51, 95 pages—Describes the design, operation and application of various types of piping, the design and use of adjustable pipe hangers, vibration eliminators and supports. —BLAW-KNOX CO.

432 **ALUMINUM JACKETING** — Folder J-25—Contains complete application instructions for Childers jacketing for weatherproofing of insulated lines, towers, vessels and tanks.—CHILDERS MFG. CO.

436 **WATER GAGE TELEVISION**—Bulletin WG-1813—Illustrates and describes equipment for televising boiler water level gages, including TV camera, illuminator, monitor and all necessary linkage, as well as auxiliary viewing monitors.—YARNALL-WARING COMPANY.

469 **BALL JOINT UNION** — Bulletin D-196—Describes how ball joint design and two bronze seats insure tightness, eliminate jammed joints, and permit reinstallation again and again.—DART UNION CO.

471 **COMPOUND STEAM TRAPS**—Bulletin No. 215, 8 pages—Discusses purpose, operation, physical data, installation of super-capacity steam traps for draining purifiers, separators, water heaters, etc. Capacities to 300,000 lb/hr.—ARMSTRONG MACHINE WORKS.

479 **MULTIPORT DRAINERS**—Publication 2925 describes Cochrane multiport drainers to provide continuous drainage, despite light weight and low space requirements.—COCHRANE CORPORATION.

494 **BRONZE GLOBE VALVE**—Form 193—Describes the new Armor Seat plug-type bronze globe valve for 300 lb service, suitable for severe services such as pressure regulation, steam control by-pass lines, temperature regulation, apparatus throttling, bleeds, drips and drains, soot blowers, continuous blow downs or any other close regulation of steam.—JENKINS BROS.

496 **PLUG VALVES**—Catalog 46-L describes a complete line of lubricated plug valves for handling acids, solvents, sludges and other troublesome liquids, giving better control, more dependable service and lower operating costs than are usually obtained.—WALWORTH CO.

MAINTENANCE PACKING GASKETS, LUBRICATION

511 **MAINTENANCE IDEAS** — "Genius at Work" contains ideas about plant maintenance, bits of philosophy, new products and a description of the company's line.—KANO LABORATORIES.

519 **INDUSTRIAL LUBRICANTS** — Catalog, 32 pages—Describes complete line of Albany greases, oils and specialties for use in bearings, chain drives, conveyors, gears, grease cups, hoists, hydraulic equipment, pneumatic tools and other industrial equipment. Properties, applications, illustrations. — ADAM COOK'S SONS, INC.

542 **CHEMICAL CLEANING IN PAPER MILLS** — Bulletin 52PI — Describes the cleaning of paper mill equipment, black liquor evaporators, heat exchangers, pipe lines—with minimum shut-down periods, by chemical means.—DOWELL, INC.

551 **CORROSION INHIBITOR** — Bulletin "VPI," 4 pages—Describes a slowly vaporising corrosion inhibiter which preserves the surface of metals by forming a protective atmosphere, which functions in the presence of such corrosive agents as moisture and oxygen.—SHELL OIL COMPANY.

564 **ANTI-CORROSIVE PAINTS**—Bulletin, "The Application of Subox and Subalex Paints"—Gives the story of a complete paint system for weather, moisture and alkali protection, with details as to application.—SUBOX, INC.

576 **MECHANICAL SEALING**—Catalog 455-SB—A family album describing various types of duro seals designed to meet specific operating conditions—a complete reference guide book. — DURAMETALLIC CORP.

ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

611 **BELT CONVEYORS**—Catalog ID-481A — Describes Continental belt conveyors featuring standard and special idlers and many convenient accessories for application in materials handling.—CONTINENTAL GIN CO.

612 **GAS-DIESEL ENGINES** — Bulletin J-51—Describes the Type JS gas-Diesel engine, built as 5, 6, and 8 cylinder stationary units developing 455 to 570 bhp. Complete specifications. — COOPER-BESSEMER CORP.

636 **CONVERSION TO LPG—ENGINE, TRUCK**—New folder "Stop Carbon Monoxide 'Hangover' "—Describes application of Beam butane-propane carburetion to fork lift trucks—to increase engine life, rid air of carbon monoxide, reduce "down-time," sludge and carbon formations, oil changes, irregular power and high fuel costs. Of par-

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653 **MONORAIL STACKER CRANES**—Bulletin AMS-1 — Outlines advantages gained by using specially designed stacker cranes for the storage of various materials under specific conditions.—AMERICAN MONORAIL CO.

693 **ADJUSTABLE VARIABLE SPEED DRIVES**—Condensed Catalog No. 165T—For engineers and salesmen in making estimates on speed control for any machine or process. Prices, dimensions, applications for ¼ hp to 25 hp motors, enclosed, drip-proof standard or special mounted.—STERLING ELECTRIC MOTORS, INC.

WATER TREATMENT, HEATING, VENTILATING, AIR CONDITIONING REFRIGERATION, DUST & FUME CONTROL

702 **WATER CONDITIONING**—Bulletin 611A, 16 pages—Gives comprehensive data on methods of conditioning water for boiler, process and general use, featuring zeolite water softeners of "double-check" design. Data on filters, purifiers, zeolites, ion-exchange resins, de-gasifiers.—ELGIN SOFTENER CORPORATION.

713 **CORROSION PROTECTION OF STEAM AND CONDENSATE RETURN SYSTEM**—Folder—Describes the recently developed Amine treatment which tends to prohibit corrosion of boiler and condensate systems by surface protection of the metal itself, with raising the pH value of the condensate.—THE BIRD-ARCHER COMPANY.

715 **PRIMING COAT FOR STEEL TANKS** — Bulletin I — Describes a method of removing mill scale from carbon steel plates, angles and channels by dipping them in sulfuric acid, wash water, and phosphoric acid bath and then applying a special coat of priming paint to the outside surfaces while the steel is still warm. This Phoscote process removes mill scale and leaves a thin iron phophate coating on the surface which improves the bond between the paint and the steel.—CHICAGO BRIDGE & IRON COMPANY.

718 **ZEOLITE SOFTENERS**—Bulletin—Gives complete details on Cochrane Zeolite softeners and the Cochrane hydromatic valve which gives automatic operation, a four position valve for service, backwash, brine, rinse and two stand-by positions.—COCHRANE CORP.

796 **WATER TREATMENT**—Bulletin 51, 8 pages—Lists 94 Nalco products by number and describes briefly their composition and use—lists principal industries using such products and typical applications in these industries.—NATIONAL ALUMINATE CORP.

ELECTRICAL

802 **GENERAL PURPOSE MOTORS**—Bulletin 51B6052J, 12 pages—Is a "Handy Guide for Quick Selection of Electric Motors," which gives valuable ready information on general purpose motors which are suitable for all types of industry.—ALLIS-CHALMERS MFG. CO.

803 **LIGHTING STANDARDS**—Catalog 31 F, complete with engineering data and illustrations—Shows "Weldforged" lighting standards for plant property, streets, highways, playgrounds, churches, housing projects, shopping centers, plants of all sorts—also mast arms and brackets.—KERRIGAN IRON WORKS, INC.

805 **COUPLING CAPACITORS FOR CARRIER CURRENT SYSTEMS**—Bulletin 206—Describes Sprague capacitors for coupling radio frequency systems to electric power distribution lines in telephone communication, in remote switching, in telemetering, in fault detecting and other carrier current uses.—SPRAGUE ELECTRIC CO.

854 **ADEQUATE WIRING** — Booklet "Wire Ahead"—Discusses preventive maintenance in electrical systems—the symptoms of inadequate wiring—and plans for anticipating electrical demands.—ANACONDA WIRE & CABLE COMPANY.

898 **SLOW SPEED ELECTRIC DRIVES** —Bulletin 172—Describes the improved Sterling slow speed electric power drives, featuring electric geared motors in various applications.—STERLING ELECTRIC MOTORS.

MISCELLANEOUS . . . SAFETY, BUILDING EQUIPMENT, METALS

914 **FLAGPOLES** — Catalog 14F—Gives engineering data on "Weldforged" steel flagpoles, describing continuous straight, tapered, and sectional steel flagpoles—construction, ground and roof settings, trucks, bases and ornaments.—KERRIGAN IRON WORKS, INC.

960 **UNIT HEATERS**—Thermolier Catalog—Describes the important features of Thermolier unit heating, an economical method of adequate plant heating.—GRINNELL CO., INC.

992 **FIRE PROTECTION**—Bulletin 2819 describes Blaw-Knox Deluge systems, wet and dry pipe sprinkler systems, water spray and fog systems, rate-of-rise sprinkler systems, etc., and indicates how a sprinkler system pays for itself out of insurance savings. — BLAW-KNOX SPRINKLER DIV., BLAW-KNOX CONSTRUCTION CO.

Continued on page 109

3-55-2

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Equipment and Review Editor
SOUTHERN POWER AND INDUSTRY
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Atlanta 5, Ga.

List Items You Want, Tear Out and Mail One of the Attached Cards Now!

Please be sure to fill in your Firm's Name and your position on the Coupon. This service cannot be extended to you unless this information is furnished.

WELDERS and PURCHASING AGENTS ARE GRABBING HOLD of the new U. S. ROYAL Gold Fluted Welding Cable

HERE'S WHAT WELDERS SAY:

"[illegible] to handle. It's so light and flexible I don't [illegible] the usual 'drag.' A cinch to handle in cramped quarters."

"I get easier grip. The *fluted* jacket does it. U.S. Royal Gold coils easily, resists kinks and tangles."

"Easier to see because of the bright yellow color. I don't trip over it. And I can easily tell it from the black cable whenever I have to use *two* cables on the machine."

"The *fluted* jacket has a greater surface area. That makes the cable cooler to handle, because heat is dissipated quicker."

HERE'S WHAT PURCHASING AGENTS SAY:

"Longer service life. U.S. Royal Gold is so flexible we get fewer failures at terminal connections. Maintenance costs go down, replacements are few and far between."

"Superior impact resistance. Tests show that U.S. Royal Gold Welding Cable possesses greater resistance to impact than conventional constructions. It shows up on my cost sheets."

"Lower accident insurance charges. U.S. Royal's bright yellow color catches everyone's eye. It also keeps workmen from running vehicles over it or letting equipment drop on it. Result: U. S. Royal Gold lasts even longer."

"It has high resistance to moisture—thanks to its 60% natural rubber jacket and its 60% natural rubber insulation."

Made exclusively by United States Rubber Company and available at your electrical supply house.

WRITE ADDRESS BELOW FOR FREE FOLDER that gives facts demonstrating the superiority of U. S. Royal Gold Fluted Welding Cable.

US RUBBER

UNITED STATES RUBBER COMPANY

Electrical Wire and Cable Department • Rockefeller Center, New York 20, New York.

dual circulation

provide high-purity steam

- with high feedwater makeup
- with high silica content feedwater
- at pressures above 600 psi

Cost-saving advantages of the exclusive FW dual circulation system now thoroughly proved by over 6 years of successful operation

THE DUAL CIRCULATION STEAM GENERATOR was developed by Foster Wheeler to provide a practical means of reducing carryover of silica and dissolved solids from 100% makeup feedwater. At pressures over 600 psi, this carryover often causes costly turbine outages. With today's trend to higher pressures and temperatures, and larger sized units, carryover problems are sharply accentuated and the dual circulation principle offers still greater advantages.

As shown in the diagram above, the Dual Circulation Steam Generator utilizes two separate heat-absorbing sections, each with its own independent natural circulating system. The primary section, comprising principally the furnace walls, is blown down at a high rate, providing the feed to the secondary section. Steam from the secondary system is returned to the primary, where it is condensed in whole or in part by the incoming feedwater. Hence, virtually all of the steam delivered to the turbine is generated in the low-concentration primary section, thus sharply reducing silica carryover and total dissolved solids.

Predicted data on the first FW Dual Circulation Steam Generators have been fully confirmed by more than six years of operation with five 300,000 lb/hr, 1350 psi units having 100% makeup. Average silica carryover is only .004 ppm, compared to .08 ppm expected for a boiler of conventional circulation. Carryover of total dissolved solids is .007 ppm, compared to .56 ppm expected for a conventional unit.

Additional benefits include reduction of tube damage due to low concentration in primary section; reduced final blowdown with substantial saving in blowdown heat recovery equipment; and reduced cost of the makeup treating plant.

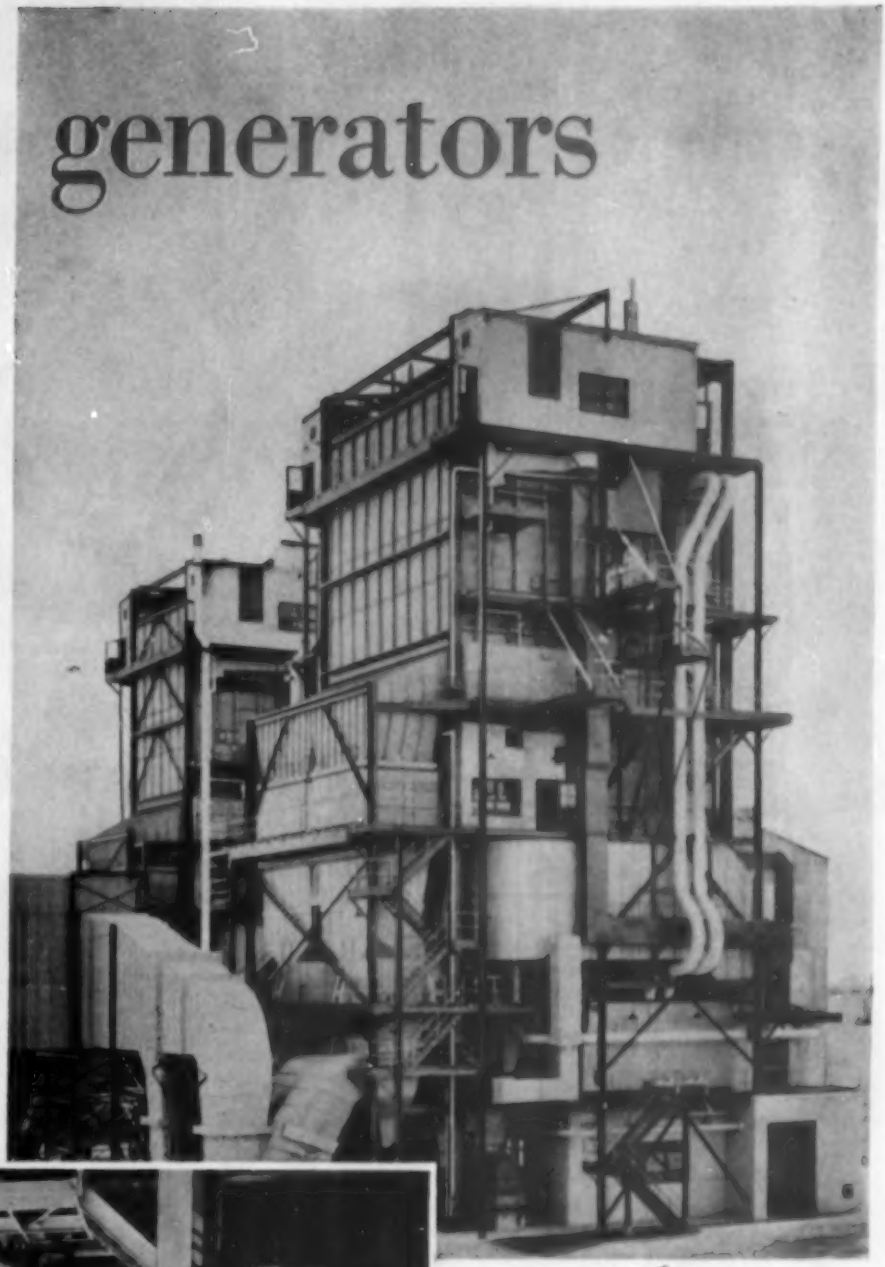
Wherever *high purity steam* is required, in central station or industrial service, FW Dual Circulation Steam Generators offer important savings in operating and maintenance cost.

FOR COMPLETE INFORMATION on FW Dual Circulation Steam Generators, send for your free copy of 16-page Bulletin B-50-11. *Foster Wheeler Corporation, 165 Broadway, New York 6, N. Y.*

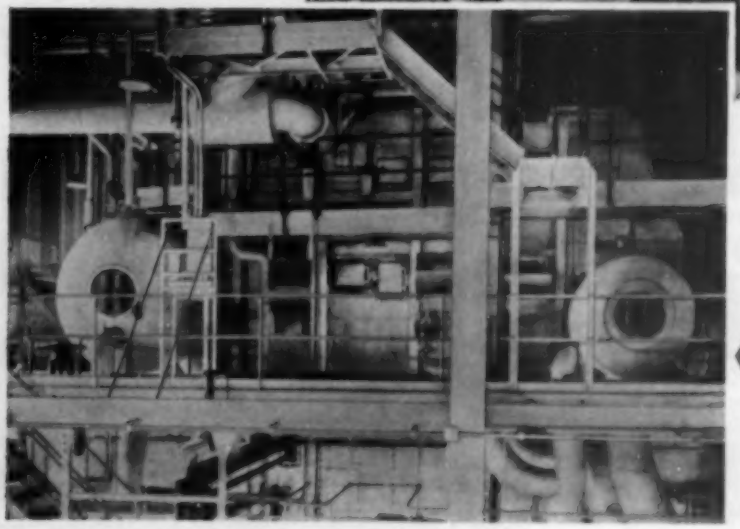
FOSTER WHEELER

steam generators

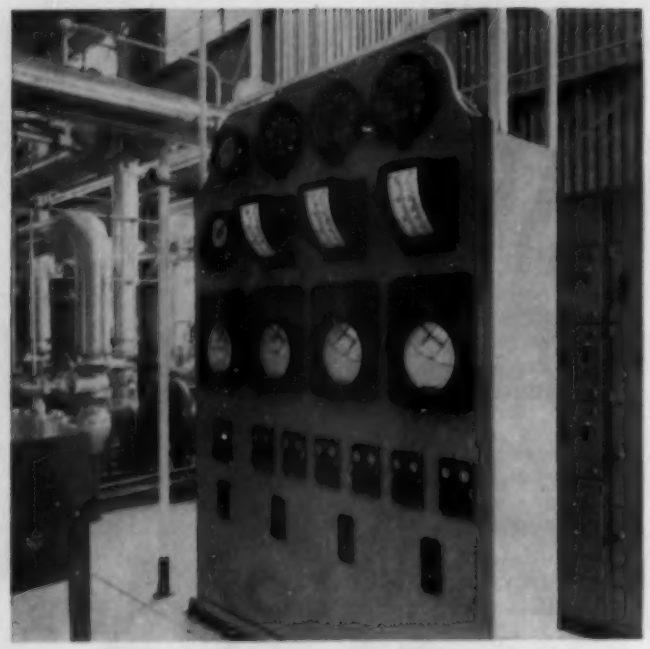
Simplified flow diagram of typical 3-drum Dual Circulation unit. Blowdown from primary feeds continuously into secondary section. Final blowdown is from secondary drum.



KANSAS GAS AND ELECTRIC CO. recently installed these two FW Dual Circulation units at the Murray Gill Steam Electric Station. One has a capacity of 425,000 lb/hr and the other, 625,000 lb/hr —both operating at 1350 psi, 955F. Consulting Engineers were Ebasco Services, Inc.



A LARGE MID-WESTERN REFINER has installed five FW Dual Circulation Steam Generators, each unit designed for 300,000 lb/hr at 1350 psi, 900F, with 100% feedwater makeup. Photo shows upper drums of one of the five 3-drum units. Consulting Engineers were Stone and Webster Engineering Corp.



Bailey Boiler Control Panel for three 150,000 lb per hr, 400 psi, gas-fired boilers. Meter at left records total Steam Flow; the other three meters record Gas Flow—Air Flow and Flue Gas Temperature.

How to Control Steam Costs

★ Close regulation of fuel and air input is vital to a strict control of your steam cost. But that's not all. You'll need control of other factors, too. Your costs can be held down only by controlling all of the important operations in your steam plant. That's where you can be sure of help from Bailey Controls. Here's why they can do the job and do it right:

1. Suitable Equipment

When you receive equipment recommendations from a Bailey Engineer his selections come from a complete line of well-engineered and carefully tested products.

2. Seasoned Engineering Experience

Your local Bailey Engineer brings you seasoned engineering experience based on thousands of successful installations involving problems in measurement, combustion, and automatic control.

3. Direct Sales-Service—close to you

For your convenience and to save time and travel expense there's a Bailey District Office or Resident Engineer in or close to your industrial community.

For greater fuel savings, less outage and safer working conditions, you owe it to yourself to investigate Bailey Controls. Ask a Bailey Engineer to arrange a visit to a nearby Bailey installation. We're glad to stand on our record.

A-125-1

FORMULA
for Cutting Steam Costs

\+ Bailey Design
\+ Bailey Engineering
\+ Bailey Service

= Greater Savings per Fuel Dollar

BAILEY
METER COMPANY
1028 IVANHOE ROAD
CLEVELAND 10, OHIO
Complete Controls for Steam Plants

BAILEY METERS
Controls for
COMBUSTION
FEED WATER
TEMPERATURE
PRESSURE
LIQUID LEVEL
FEED PUMP

GULFCREST *is the only turbine oil that is super refined for superior performance by the* ALCHLOR PROCESS

Barrel No. 1 contains a highly refined oil that will become Gulfcrest. It has gone through the usual steps used in refining other turbine oils—but has not yet been Alchlor Processed.

Barrel No. 2 contains the part —approximately 15%—discarded by the Alchlor Process. This discarded portion contains unstable hydrocarbons which, if allowed to remain in a turbine oil, are likely to oxidize, increase neutralization number, form sludge, emulsifiers, and harmful acids.

Barrel No. 3 contains Alchlor Processed Gulfcrest—the incomparably pure lubricant that lasts longer, gives superior performance and helps keep your turbine systems clean indefinitely. To make Gulfcrest even finer, special inhibitors are added to give it still greater stability and protect against corrosion and foam.

Call your nearest Gulf office today and have a Gulf Sales Engineer recommend the proper grade of Gulfcrest Oil to meet the specific requirements of your turbines.

GULF

GULF OIL CORPORATION • GULF REFINING COMPANY • 1822 Gulf Building, Pittsburgh 30, Pa.

This CRANE VALVE begins new life after 37 years' service!

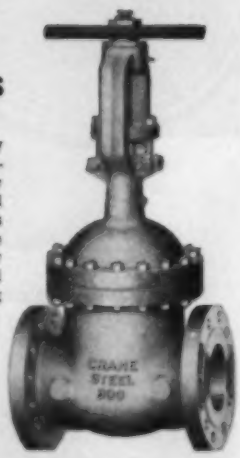
THE CASE HISTORY—World War One still raged when Cincinnati Gas & Electric Co. installed this Crane steel gate valve in 1917 at its Front & Rose Street Station. Ever since, it has safely controlled the main steam lead to No. 1 turbine—always making tight closure when needed—always responding smoothly to its hydraulic operator. For 37 years it has given such service with no more than routine maintenance—under operating pressure of 250 psi at 600 deg. F.

In 1954, the No. 1 turbine was renewed. The Crane steel valve—with complete confidence in Crane durable quality as demonstrated—was given limited preventive maintenance while down, and reinstalled in its original location.

Long life with minimum maintenance is a deeply rooted characteristic of Crane valves. That's what makes them industry's first choice today for low ultimate cost.

CRANE STEEL GATE VALVES
... a complete line

Here is steel casting at its best, by the pioneer in steel valve development. Here is value in durability . . . dependable operation . . . and in low-cost maintenance that sets Crane steel valves apart from the ordinary. They're made for every service—in all pressure classes and sizes. Consult your Crane Catalog or Crane Representative.



CRANE CO.

General Offices: 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • KITCHENS • PLUMBING • HEATING

CRANE'S FIRST CENTURY . . . 1855-1955

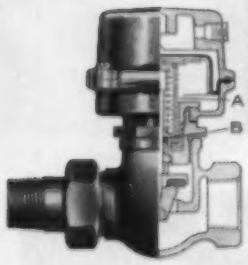
175 Year old problem of storing and handling records solved by this unique modern building

UNITED STATES MILITARY PERSONNEL RECORDS CENTER

In Northwest St. Louis County, Mo.

Hellmuth, Yamasaki & Leinweber, Architects ★ John D. Falvey, Mechanical Engineer
Thomas J. Sheehan Co., Heating and Plumbing Contractor

POWERS



POWERS PACKLESS CONTROL VALVE

—one of the many superior features of a Powers control system. Their duo-seal construction (A & B) reduces valve stem friction, eliminates packing maintenance and leakage of water or steam and gives smooth accurate control.

Temperature and Humidity Control Used Here

With the completion of this $12,500,000 building, records of discharged members of ALL armed forces will be properly stored and handled in one skilfully planned and well designed building . . . for the first time since the Revolutionary War.

The main building of the Records Center is six stories high, 728′ long 282′ wide. It houses the working areas while the two story assembly building 237′ x 103′ provides dining, meeting and other facilities.

Heated and air conditioned spaces and film developing baths in photographic and microfilming laboratories are all thermostatically controlled by POWERS.

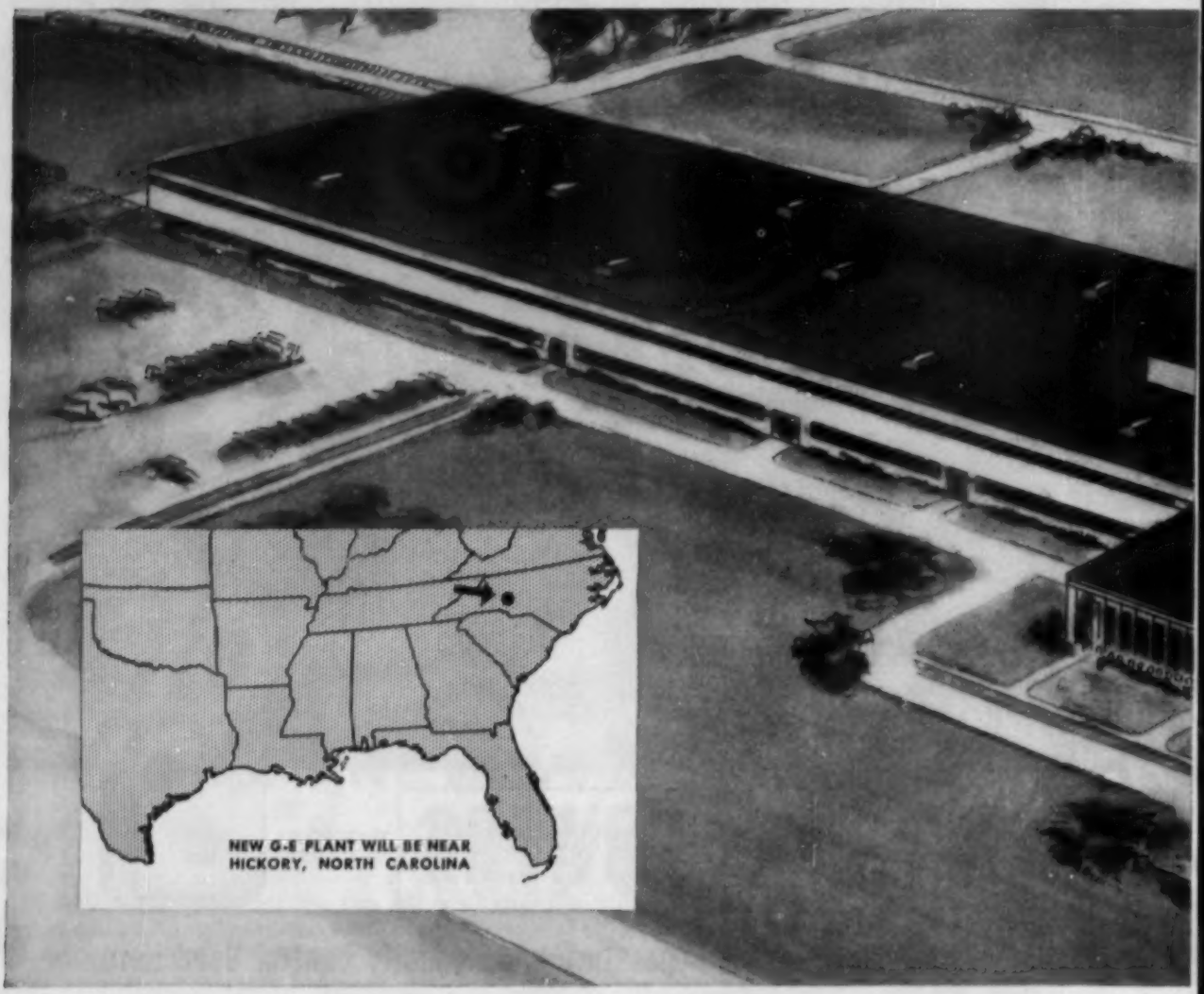
Your temperature and humidity control problems, however different from those encountered in this building, can be successfully solved with the time proven versatility and dependable performance of Powers Control. (a17)

Established in 1891

THE POWERS REGULATOR COMPANY

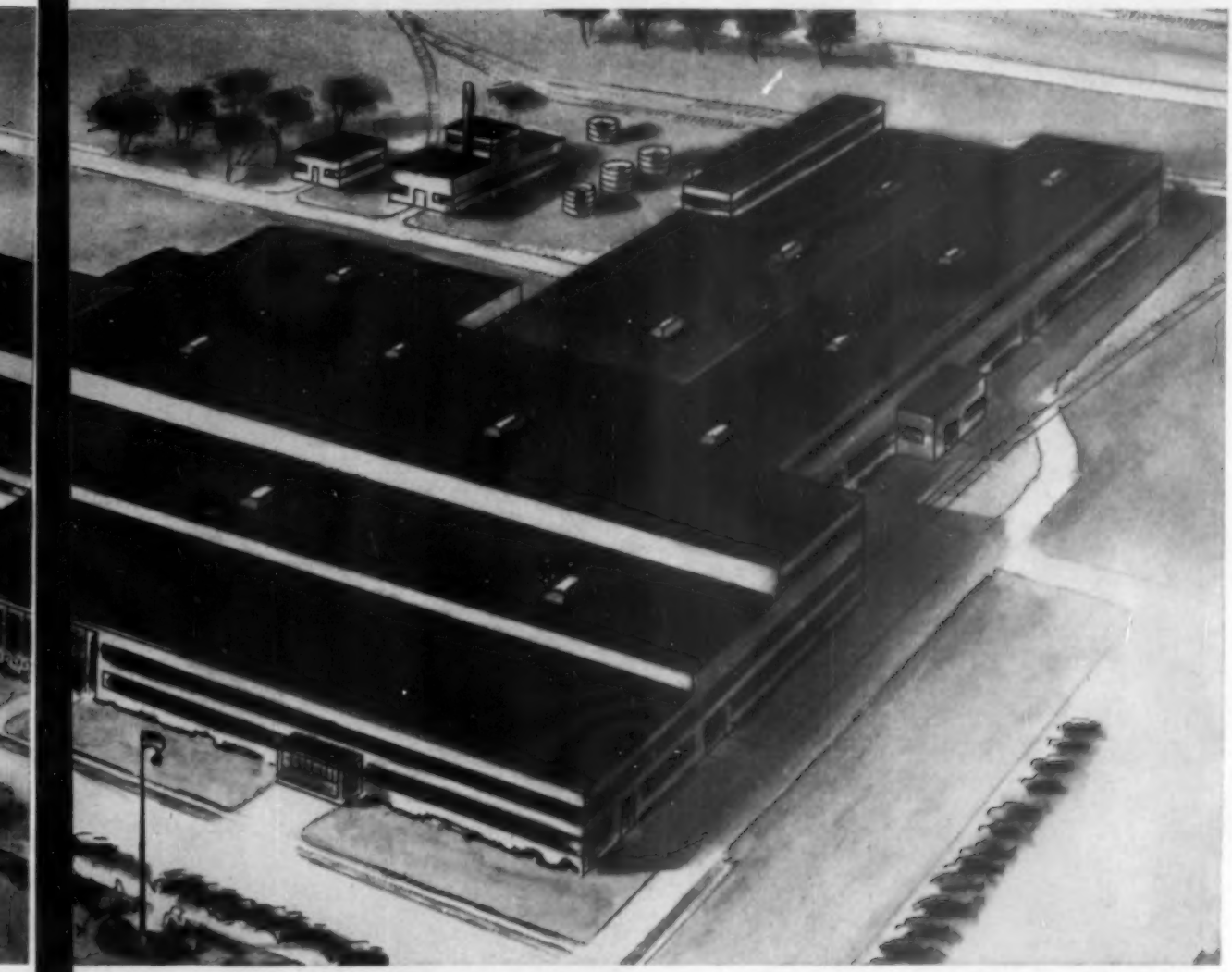
SKOKIE, ILLINOIS • *Offices in 60 Cities in the U.S.A., Canada and Mexico*
1333 Spring St., Atlanta, Ga.—101 N. Elm St., Greensboro, N. C.

Another G-E transformer plant



NEW GENERAL ELECTRIC PLANT WILL MANUFACTURE A COMPLETE LINE OF POLE-TYPE DISTRIBUTION TRANSFORMERS

to serve the booming South



NEW TWENTY-MILLION-DOLLAR DISTRIBUTION TRANSFORMER PLANT TO BE BUILT IN HICKORY-NEWTON-CONOVER AREA OF NORTH CAROLINA

Located in the foothills of the Piedmont Range within 100 miles of Charlotte, this new General Electric plant is scheduled for completion late in 1956 and will eventually employ over eleven hundred people. The second major G-E transformer expansion into the South—General Electric's Medium Transformer Plant in Rome, Georgia, was opened in May, 1954—this new plant will build distribution transformers for electric utility and industrial use. It should enable General Electric to better serve your growing electrical needs. General Electric Company, Schenectady 5, New York. 431-28

Progress Is Our Most Important Product

GENERAL ELECTRIC

2 B&W Boilers Make Major Contribution to efficiency and

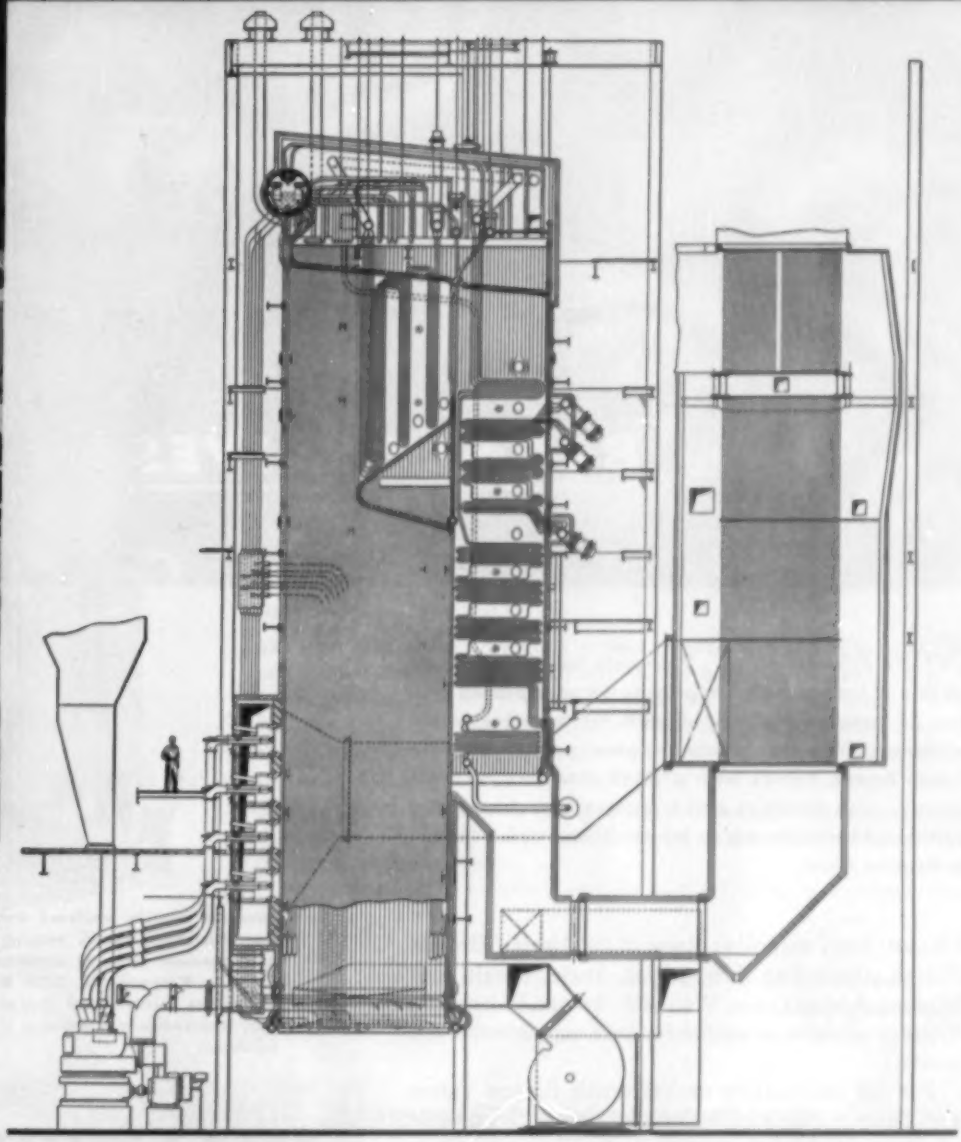
Utilizing design improvements developed to increase power generation efficiency and raise the level of unit availability, Pennsylvania Electric Company's new Shawville Station truly typifies power progress while demonstrating Penelec's awareness of future requirements in the area it serves. Currently operating as a two-unit plant, Shawville Station will eventually be expanded to 4 units and have a capacity totalling more than 500,000 kw.

Another addition in General Public Utilities' expansion program, Shawville Station is situated in coal fields near the center of Penelec's system load. Its two identical B&W Radiant Reheat Boilers have a design pressure of 2080 psi and a combined steam capacity of 1,788,000 lb per hr. These units include B&W Cyclone Steam Separators for natural circulation and each is equipped with 16 burners served by 4 B&W Pulverizers. This installation also includes B&W tubular airheaters and B&W continuous-tube type economizers.

Modern in every sense, Shawville Station has already demonstrated its efficiency during the first months of operation. It is one more practical tribute to the unending efforts of progressive electric companies, consulting engineers and B&W boiler experts working cooperatively to further advance the science of steam-electric power generation.

high availability
at SHAWVILLE STATION

Shawville Station of the Pennsylvania Electric Company. Engineering design and construction supervisory services by Gilbert Associates, Inc.



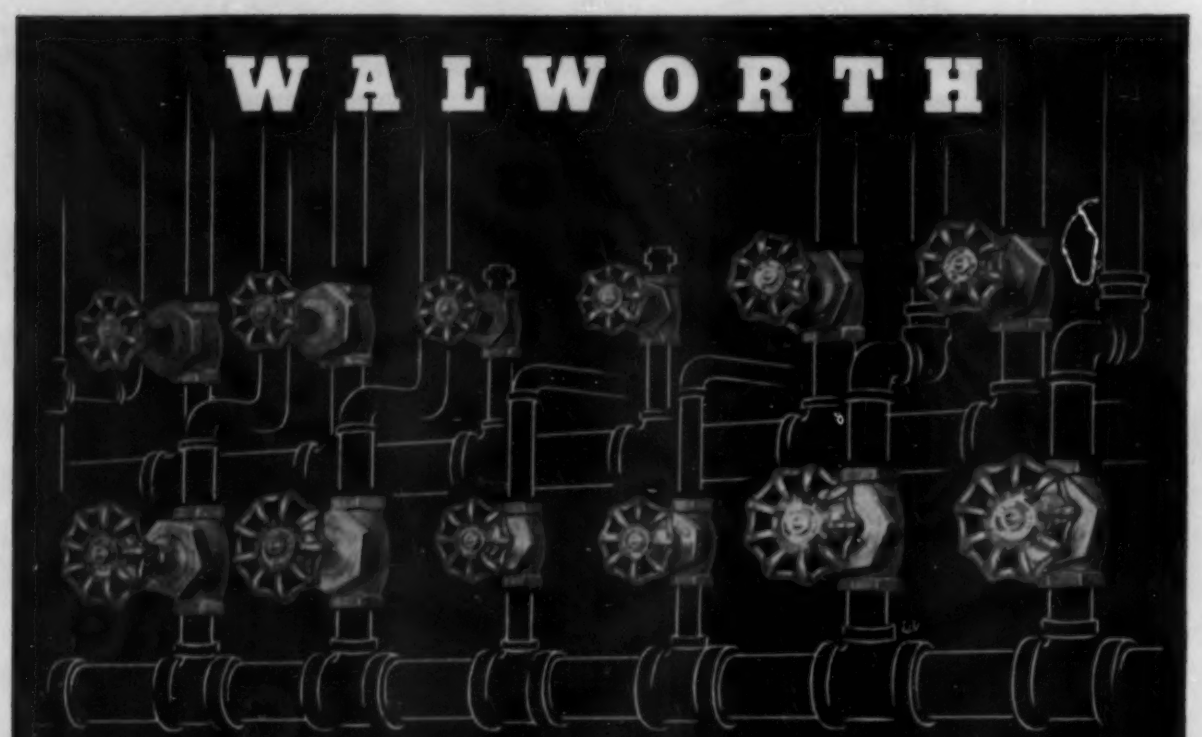
One of two identical, dry-bottom B&W Radiant Boilers now supplying steam at Shawville. Steam capacity is 894,000 lb per hr per unit. Steam pressure is 1900 psi at the superheater outlet and temperature is 1055 F with reheat to 1005 F.

BABCOCK & WILCOX

BOILER DIVISION

G-687

WALWORTH



BRONZE VALVES

Better because ... **Walworth has standardized its line of bronze valves to provide an unsurpassed system of interchangeability of parts for assembly or replacement. You can maintain a great number of Walworth Bronze Valves with a small inventory of basic parts ... you minimize part replacement problems. For further information, ask us for our Bronze Valve Standardization Chart.**

Parts are carefully machined and finished to close tolerances, thereby assuring accurate fit and alignment under all conditions. Sectioned valve is Walworth No. 225P Bronze Globe Valve with stainless steel plug-type seat and disc, heat-treated to a minimum of 500 Brinell hardness.

Choose from complete lines of Walworth Bronze Valves – including gate, globe, angle, check, and lubricated plug types. Walseal® Bronze Valves and Fittings are also available for making silver-brazed joints.

For full information on Walworth Bronze Valves and Fittings, call your Walworth Distributor, nearest Walworth Sales Office, or write to Walworth Company, General Offices, 60 East 42nd Street, New York 17, N. Y.

WALWORTH

Manufacturers since 1842

valves ... pipe fittings ... pipe wrenches

60 East 42nd Street, New York 17, N. Y.

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NOW! FULL AUTOMATION OF FLYASH REMOVAL

...with A·S·H *Automatic Handling Systems*

Increased handling rates, less manpower, elimination of human error—these are the advantages of full automation with Allen-Sherman-Hoff Automatic Flyash Removal Systems.

AUTOMATIC ASH REMOVAL REDUCES TIME, COST, WEAR—A-S-H systems greatly reduce time required for ash removal. No walking from station to station to actuate valves. No worrying about switching from one valve to the next at precisely the right moment. Automatic sequencing from one valve to another occurs in a matter of seconds. Automatic, quick-acting shut-off of the individual valves eliminates unnecessary sand blasting of transport lines . . . thus reducing wear and maintenance.

PINPOINT CONTROL WHEN YOU NEED IT—A-S-H systems can be adjusted to by-pass any valve or valves. Valves can also be actuated manually to suit unusual operating conditions.

FOOLPROOF "PROGRAMMING" GEARED TO DAILY, WEEKLY REQUIREMENTS—A-S-H systems can be "programmed" to operate automatically at a given period each day or each work cycle. The operation of A-S-H controls is foolproof—the unit will not deviate from the established setting.

FLEXIBILITY AN IMPORTANT FEATURE—The flexibility of A-S-H systems makes it possible to extend automatic control to collecting and storage apparatus with all necessary crossovers and check features. Control can be used to interlock two or more complete systems.

Additions can be made to control system with only minor changes in the basic control unit.

GRAPHIC PANEL TELLS WHAT IS GOING ON—WHERE—An integral light panel indicates the operational sequence through the entire system. An instrument on the control panel indicates the prevailing vacuum. When required a recorder can be furnished to register the operating vacuum throughout the complete removal process—providing a permanent record for the operator's review and study.

COMPLETE CONTROLS IN A SINGLE UNIT—All controls—program timers, vacuum gauges, etc.—are housed in a single factory-tested panel unit, requiring minimum space.

No field work is required—simply connect unit to terminal block of system.

. . . . . .

Detailed Technical Data covering these and many other features of A-S-H Automatic Flyash Removal Systems is now being prepared. To reserve your copy write to Dept. A 2 at the address below.

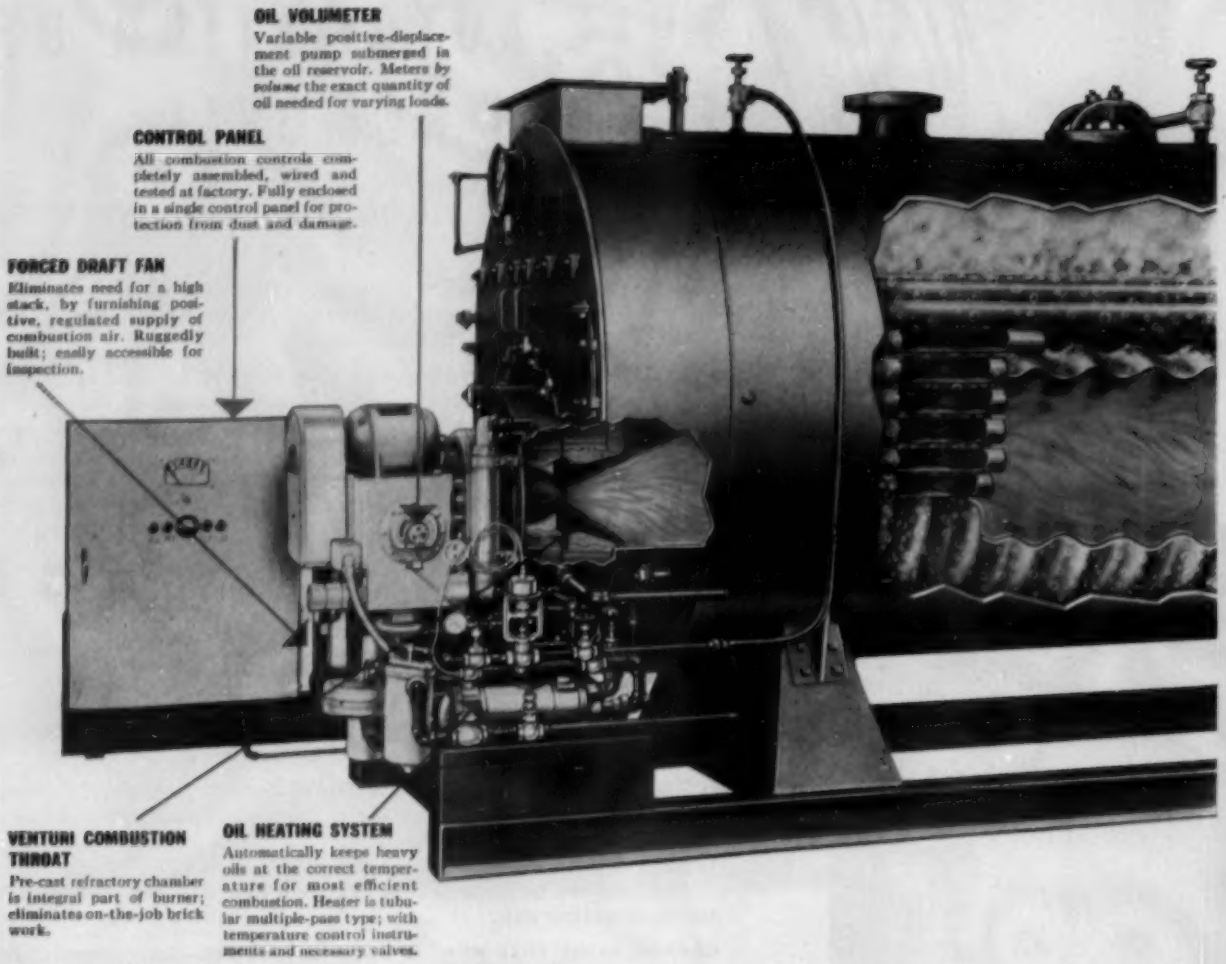
The **Allen-Sherman-Hoff** Company

259 E. LANCASTER AVE., WYNNEWOOD, PA.

Offices and Representatives in Principal Cities

MATERIALS HANDLING SYSTEMS

hydrojet *hydraulic* / **hydrovac** *pneumatic*


OIL VOLUMETER
Variable positive-displacement pump submerged in the oil reservoir. Meters by volume the exact quantity of oil needed for varying loads.
CONTROL PANEL
All combustion controls completely assembled, wired and tested at factory. Fully enclosed in a single control panel for protection from dust and damage.
FORCED DRAFT FAN
Eliminates need for a high stack, by furnishing positive, regulated supply of combustion air. Ruggedly built; easily accessible for inspection.
VENTURI COMBUSTION THROAT
Pre-cast refractory chamber is integral part of burner; eliminates on-the-job brick work.
OIL HEATING SYSTEM
Automatically keeps heavy oils at the correct temperature for most efficient combustion. Heater is tubular multiple-pass type; with temperature control instruments and necessary valves.

Perfectly balanced firing

IT HAS TO BE PLANNED

Iron Fireman firing systems are available as complete package boiler-burner units of the type shown above, or as separate package burners for installation in your present boilers.

No mere conversion burner, these package burner units contain every component for balanced firing: single or dual-fuel systems and burners, forced draft air supply, built-in combustion refractory, completely wired and tested controls.

Iron Fireman burner units are carefully assembled and tested at the factory. This means the kind of continuing dependability and operating efficiency seldom achieved with local assembly.

INSTALLATION SAVINGS, TOO

Long-range savings should be the main consideration in your choice of a firing system. But don't overlook the *installation savings* that you can also make with an Iron Fireman package burner. There's little more involved than bolting to the boiler front, and making fuel and electrical connections. Iron Fireman package burners are engineered for firing practically all types of steam and hot water boilers.

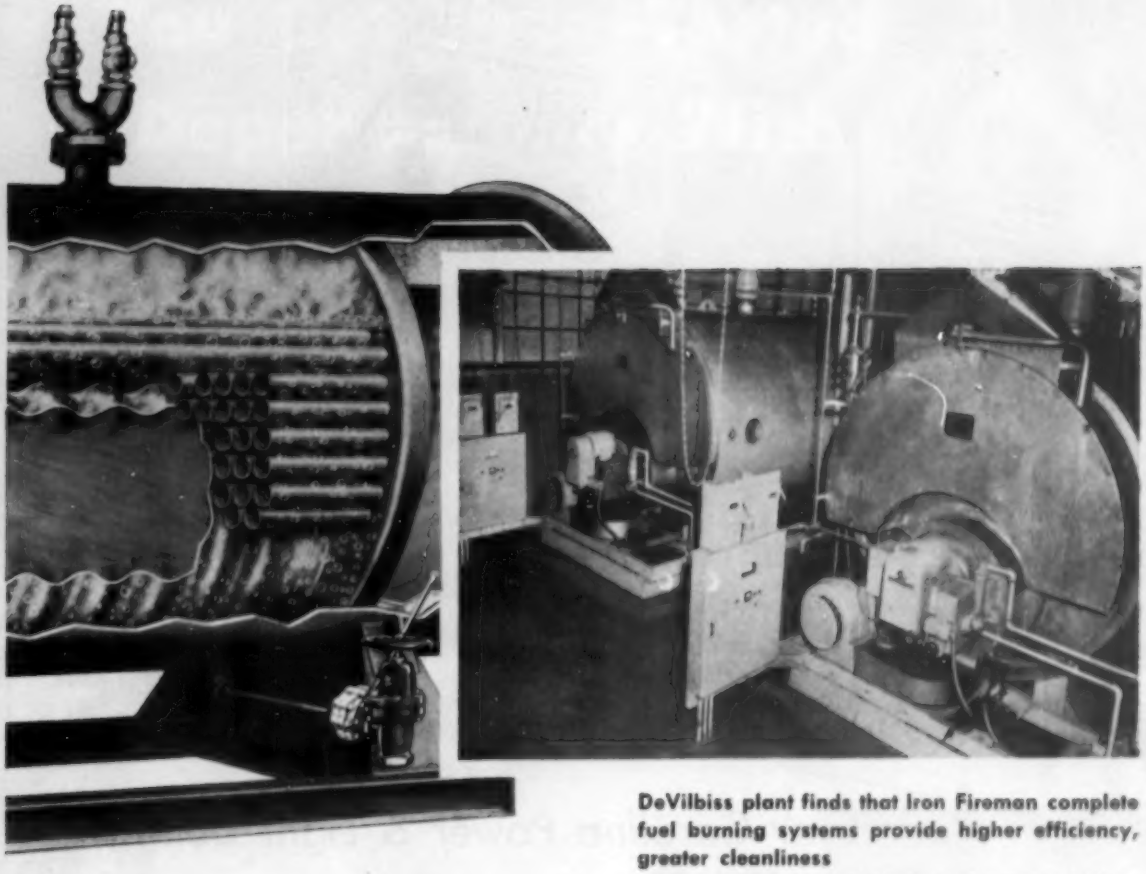
FOR OIL OR GAS, OR BOTH

Iron Fireman package burners with dual-fuel systems

THE IRON FIREMAN

Iron

OIL, GAS OR COAL



DeVilbiss plant finds that Iron Fireman complete fuel burning systems provide higher efficiency, greater cleanliness

This photograph of the DeVilbiss boiler room at Barrie, Ontario, Canada, shows two Iron Fireman boiler-burner combination units installed there last year. Officials report performance has been highly satisfactory. Installation was made by Tewes Engineering, Toronto, Ontario.

is no accident . . .

can bring greater economy to your operations in two important ways. First, you can take full advantage of seasonal fuel price cuts. And second, in event of emergency fuel shortages you can rapidly switch over *without* expensive shut-downs. Controls are actually changed from one fuel to another with just the flick of a switch!

Gas of any type is effectively burned with the Iron Fireman ring type gas burner. And he horizontal rotary oil burner, shown above, brings you steady and economical power with heat-rich heavy oils.

GET COMPLETE INFORMATION

Fuel savings . . . installation savings . . . dependable long-range operation. Certainly these features belong in *your* plant.

For complete technical information on the Iron Fireman package burner, send the coupon.

Fireman®

FIRING FOR HEATING, PROCESSING, POWER

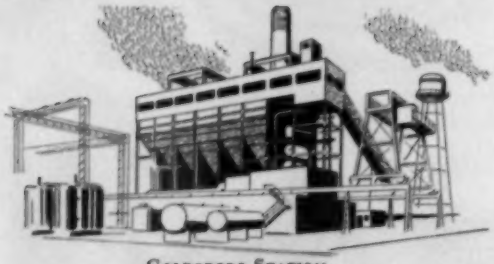
IRON FIREMAN MANUFACTURING CO.
3048 West 106th Street, Cleveland 11, Ohio
In Canada, write 80 Ward Street, Toronto, Ontario.

Please send detailed information on Iron Fireman package burner units for oil, gas, or oil-gas dual firing.

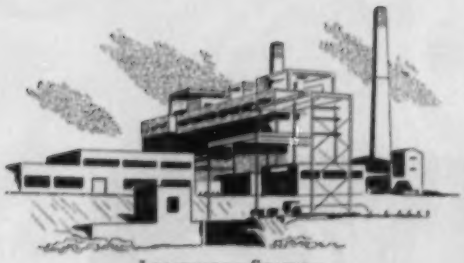
Name_____

Address_____

City_____ State_____



GOLDSBORO STATION
Total capability 169,000 kw.



LUMBERTON STATION
Total capability 185,000 kw.

WILMINGTON STATION
Total capability 230,000 kw. (est.)

Grinnell piping products have played a vital role in the construction of

7 NEW UNITS IN 7 YEARS

for Carolina Power & Light Company

HERE IS THE RECORD!
(Completion dates)
1949 . . . Lumberton Station, Unit #1
1950 . . . Lumberton Station, Unit #2
1951 . . . Goldsboro Station, Unit #2
1952 . . . Goldsboro Station, Unit #1
1952 . . . Lumberton Station, Unit #3
1954 . . . Wilmington Station, Unit #1
(Scheduled completion date)
1955 . . . Wilmington Station, Unit #2

Main steam line in WILMINGTON plant, fabricated by Grinnell, and supported by Grinnell Model R Constant-Support Hangers.

Since 1949, Carolina Power & Light's modernization and improvement program has been in full swing. Over this 6-year period, 6 new steam-electric generating units have been added to the system, with another scheduled for completion early in 1955. And very significantly, in each of these seven new units, Grinnell Prefabricated Piping and Grinnell Engineered Hangers have been employed, *exclusively!*

This continuous use of Grinnell Piping Products over the years means that Grinnell has successfully passed the most exacting test of all . . . the "test" of actual performance . . . on the job . . . day-in and day-out.

Piping fabricated in Grinnell shops is done under ideal conditions, with modern equipment, by personnel qualified for each class of work. Included in the price (which is determined in advance) are such items of expense as: interpretive engineering, shop sketches and planning, procurement of materials, power services, expendable tools and supplies. There are no charges for waste material or spoilage. All piping is rigidly inspected and tested to comply exactly with customer specifications and applicable codes. Consult Grinnell on your next piping job.

GRINNELL

WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
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You Get Time-Tested Dependability With

Visit Booth 335

NAVCO Counterpoise*

Pipe Hangers

The constant load-carrying capacity of Navco Counterpoise* Pipe Hangers has been proven during an extended period of satisfactory service as the first accurate and efficient support for high temperature piping systems. They are being used extensively in steam generating stations, refineries and chemical plants.

The Counterpoise Hanger is a spring-actuated counterbalance. An ingenious system of linkage transforms the varying force of the spring in an accurate mathematical ratio to produce a load supporting effort of constant value throughout the entire range of expansion travel.

The design permits great flexibility of installation and saves valuable space in congested areas. All parts are ruggedly made and have a high safety factor, yet excess weight and oversize physical dimensions have been avoided to hold space and structural load requirements to a minimum.

The Navco Counterpoise Hanger is available in 16 different frame sizes with load capacities ranging from 200 to 16,000 pounds and expansion travels up to 12 inches. For detailed information on how you can get dependable support with this unique hanger, write today for our 12-page illustrated bulletin #153.

Note above how the flexible top connection permits the hanger assembly to fall in line with the direction of the load pull, so that horizontal travel of the piping has no appreciable effect on the hanger operation. The unit may be positioned at any angle. This affords flexibility in installations where close clearances are a factor.

** Counterpoise is a trade name of the National Valve & Manufacturing Company*

NATIONAL VALVE & MANUFACTURING COMPANY

3106 LIBERTY AVENUE, PITTSBURGH 1, PENNSYLVANIA

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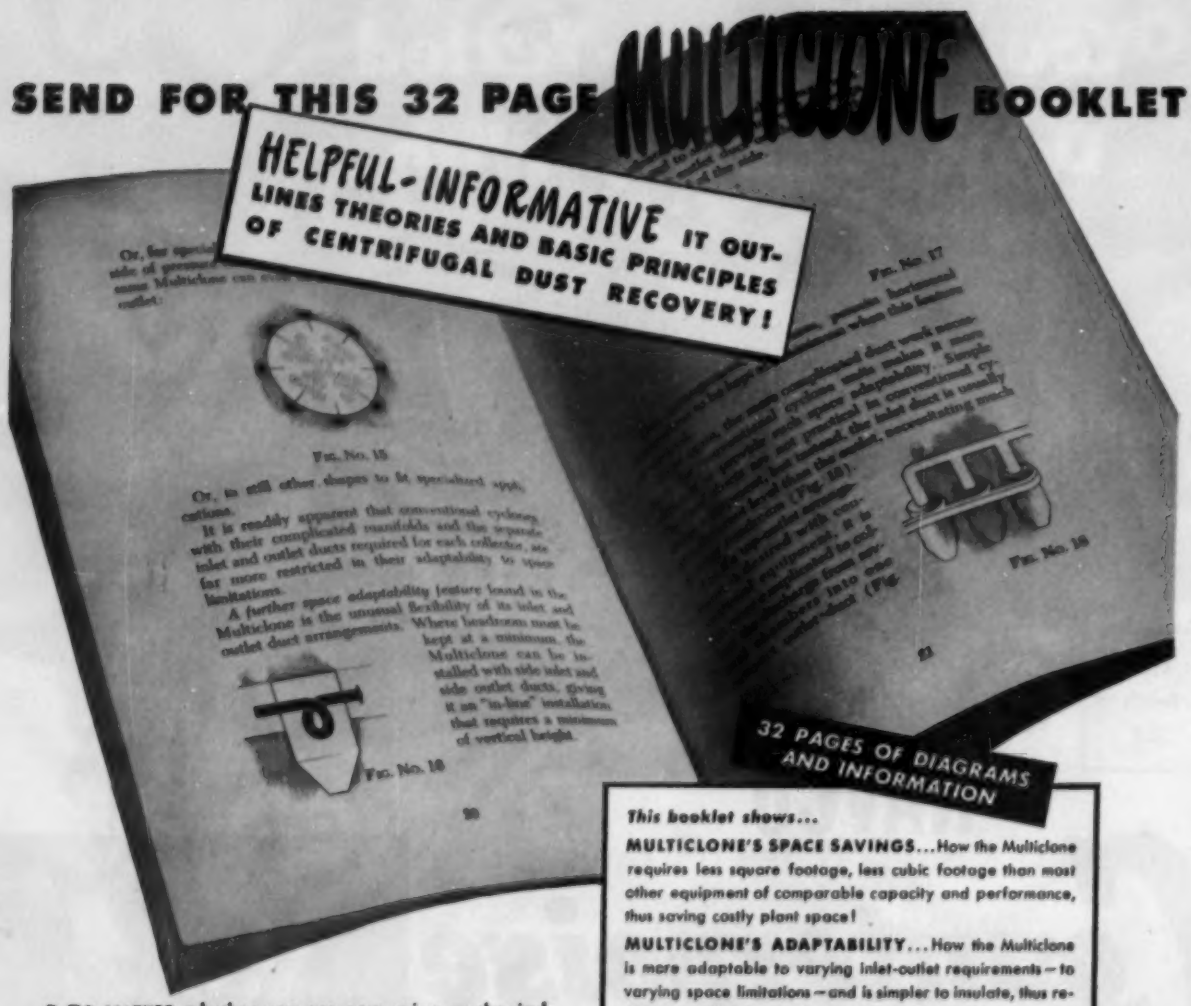
HELPFUL-INFORMATIVE IT OUTLINES THEORIES AND BASIC PRINCIPLES OF CENTRIFUGAL DUST RECOVERY!
Fig. No. 15
Fig. No. 16
Fig. No. 17
Fig. No. 18
32 PAGES OF DIAGRAMS AND INFORMATION

NO MATTER whether you are now using mechanical dust recovery equipment or are planning the installation of such equipment at some future date, here is a booklet that is full of helpful and valuable information on centrifugal dust recovery. It not only explains the basic methods and principles involved, but also shows the important differences between small and large diameter separating tubes, shows how to simplify your duct work and reduce installation costs, and outlines many other important factors to be considered in selecting mechanical dust recovery equipment.

In addition, this informative booklet illustrates and explains how MULTICLONE'S unique *vane* design is fundamentally different...how it makes possible greater compactness, simpler installation, high recovery of the small particles as well as the medium and coarser ones, and many other facts on MULTICLONE advanced design.

A limited supply of these booklets is available for free distribution to those interested in mechanical recovery equipment and methods. Write for your copy today.

This booklet shows...

MULTICLONE'S SPACE SAVINGS...How the Multiclone requires less square footage, less cubic footage than most other equipment of comparable capacity and performance, thus saving costly plant space!

MULTICLONE'S ADAPTABILITY...How the Multiclone is more adaptable to varying inlet-outlet requirements—to varying space limitations—and is simpler to insulate, thus reducing installation costs!

MULTICLONE'S EFFICIENCY...How Multiclone's multiple *small diameter* tubes, made possible by its exclusive vane design, give higher centrifugal forces and more complete cleansing of *all* suspended particles—even small ones of 10 microns and less!

MULTICLONE'S LOW MAINTENANCE...How the Multiclone has no high speed moving parts to repair or replace, no pads or filters to clean or renew, nothing to choke gas flow or increase draft losses as suspended materials are recovered. Multiclone draft losses remain uniformly low—recovery efficiencies uniformly high—at all times!

Make sure that a copy of this helpful booklet is in your reference files by sending for your copy now!

NOW SELLING...

COTTRELL Precipitators
MULTICLONE Collectors
TURBULAIRE Spray Dryers

...in all parts of the U.S.A. and foreign countries.

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DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

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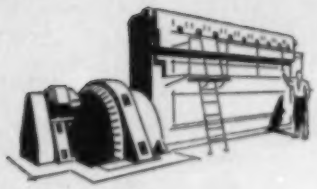


"Cured... bearing failure in their diesel-driven, front-end loaders"

A large fire-brick manufacturing company in the Philadelphia area had the problem of premature bearing failure in its diesel-driven loaders and shovel.

Headlights on even in daylight...

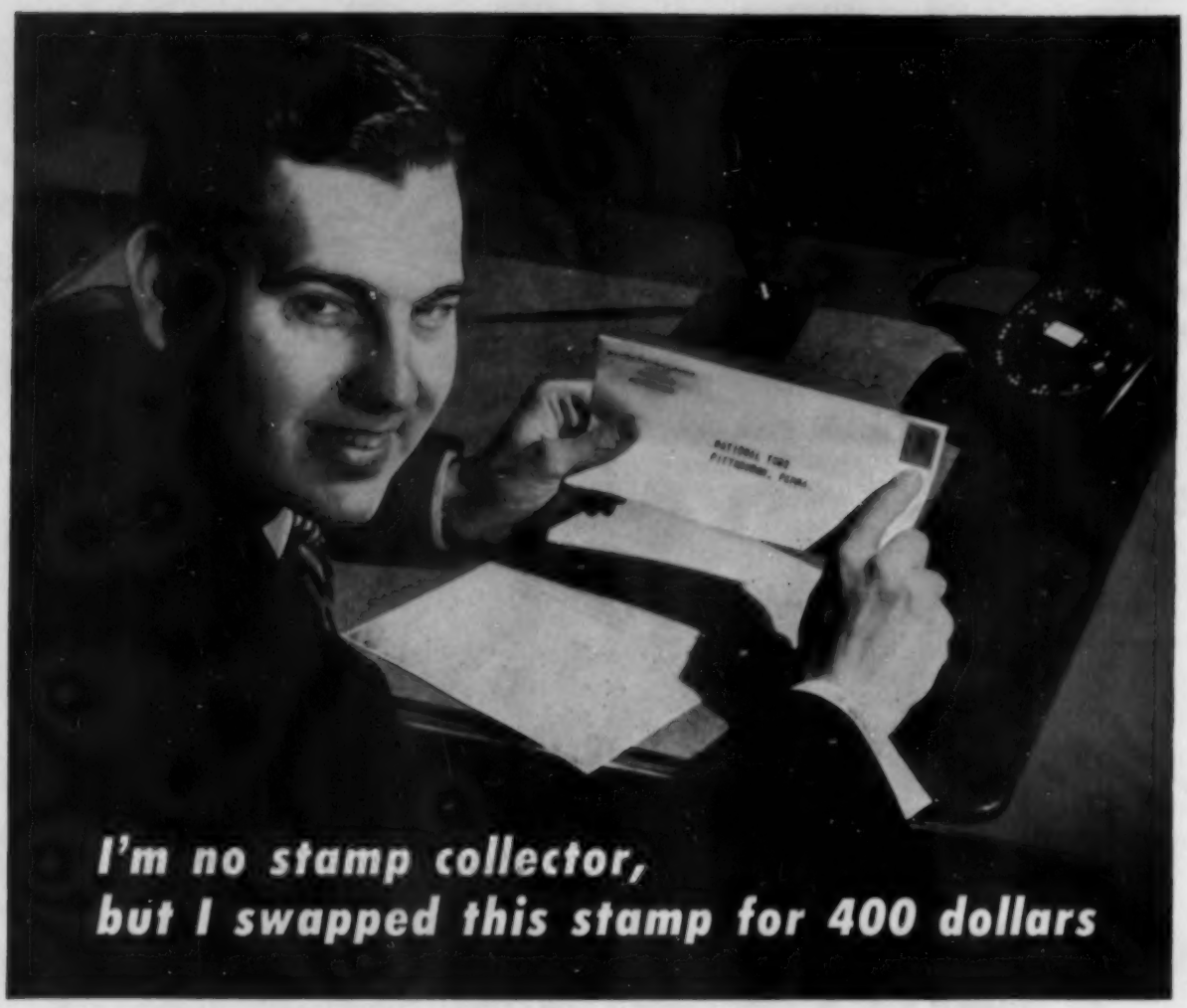
Sinclair Lubrication Engineer Harry Donovan reports, "These units were operating around the clock under conditions *so dusty that headlights were required.* Crankcases had to be drained and flushed bi-weekly! My first recommendation was closer adherence to an air filter maintenance program."

Drain intervals doubled!

Mr. Donovan continues, "Further observation proved to me that excessive idling and overloading were all contributing factors to a severe sludge condition. I recommended Sinclair SUPER TENOL® – explaining that the superior quality of the base oil plus the Sinclair formulated additives would extend bearing life *while at the same time removing accumulated lacquer and sludge.* A trial period proved SUPER TENOL doubled drain intervals and eliminated flushing entirely. This company now uses Sinclair SUPER TENOL exclusively."

Why not give a Sinclair Lubrication Engineer the chance to solve *your* lubrication problems? *There's no obligation.* Contact your local Sinclair office or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR LUBRICANTS



I don't know anything about rare old stamps. The stamp I put on this letter was an ordinary three-center, but it proved to be just as valuable as many a collector's item.

WALLS WITHOUT WELDS

Here's what happened:

We retubed a large section of the plant recently with high pressure steam piping. I worked out a tubing analysis to handle the higher temperatures and pressures we planned to use; a good safe analysis—high alloy steel in a heavyweight seamless grade.

However, before I ordered the pipe, I thought I'd take advantage of National Tube's free advisory service, so I wrote a letter asking for *their* tubing recommendation. That's when I swapped my three-cent stamp for 400 dollars.

National Tube's recommendation turned out to be a less expensive tubing, yet it was the *exact* analysis for the job. My analysis was a little too good—really more than the installation warranted. When the costs were figured, the National Tube recommendation was 400 dollars less than mine—a direct savings for our plant. The advice had cost me just three cents. Not a bad investment, was it?

When you are in the market for pipe and tubing, call or write National Tube. You'll get the right analysis for the job, every time—at the lowest cost to you.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
(Tubing Specialties)

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

NATIONAL *Seamless* PIPE AND TUBES

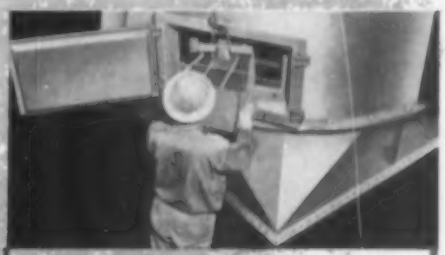
UNITED STATES STEEL

why soot is no problem... with the Ljungstrom® Air Preheater

Soot is no problem with the Ljungstrom. Clinging soot or slag is loosened by normal expansion and contraction of the preheater . . . and most of it is blown away by the high-velocity gas streams. What remains is removed by superheated steam or compressed air, fired from oscillating soot blowers, while the Ljungstroms are in operation.

What's more, moderate deposits on the Ljungstrom heating surface have no effect on preheating. For, with the Ljungstrom, heat need not pass through a film-coated wall — but is simply absorbed by a heating surface and *released from the same surface.*

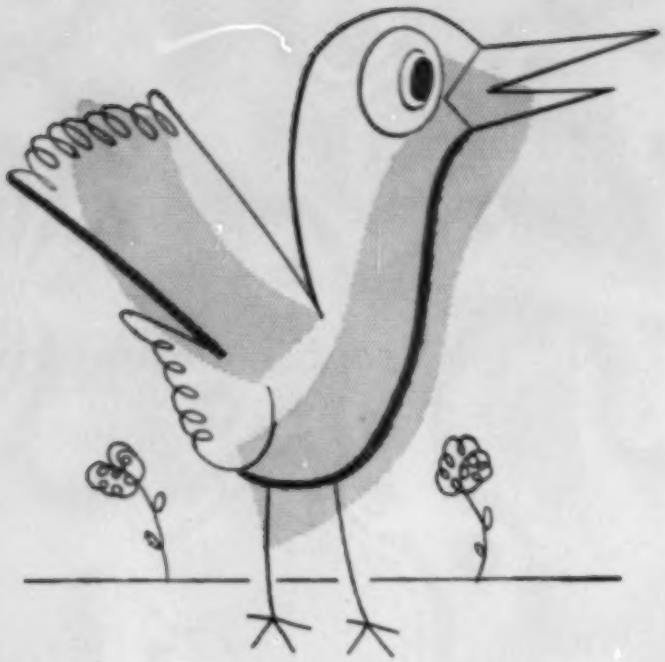
Get all the details on why the Ljungstrom is easier to clean and maintain . . . maintains higher boiler efficiencies. They're in the new, 38-page reference manual, "Ljungstrom Air Preheaters." Write for your free copy, today!



Advantages of the Ljungstrom Air Preheater

- Size for size, recovers more heat than any other type.
- Reduces fuel consumption. Permits use of lower-grade fuels. Increases boiler output and reliability.
- Eliminates cold spots . . . keeps corrosion to a minimum.
- Easier, faster to clean and maintain.
- Requires far less supporting steel and is quickly erected.

The Air Preheater Corporation 60 East 42nd Street, New York 17, N. Y.



HARD WATER IS FOR THE BIRDS

Maybe birds and flowers like hard water—but we doubt it. Most people don't. Especially those who use large quantities of water, as needed for boilers, processing, water heaters and other services, where ordinary water just won't do.

And that's where Elgin-Refinite comes in. Water softening and conditioning is our business. We have been at it for nearly a half century during which we have come up with some of the most important developments in the field.

For example, our water softener of "Double-Check" design makes possible a deeper zeolite bed which increases soft water output as much as 44% —yet it costs so little more. The ingenious "double-check" arrangement also prevents costly loss of zeolite (this arrangement can be easily installed in your present water softener).

High capacity Elgin zeolites give 3 to 10 times more capacity of soft water output per regeneration. And then there is the outstanding Elgin Ultramatic Water Softener—today's finest fully automatic water softening equipment. Its automatic control mechanism is readily adaptable to any existing water softener.

Yes, if you require soft water in large or small quantities, or any of the water conditioning equipment shown below, let us put the nearest Elgin-Refinite man in touch with you.

Elgin-Refinite • *Division of Elgin Softener Corporation*
132 N. Grove Ave., Elgin, Illinois
Representatives in Principal Cities • In Canada: G. F. Sterne & Sons, Brantford

Elgin REFINITE SINCE 1908

Water Conditioning since 1908

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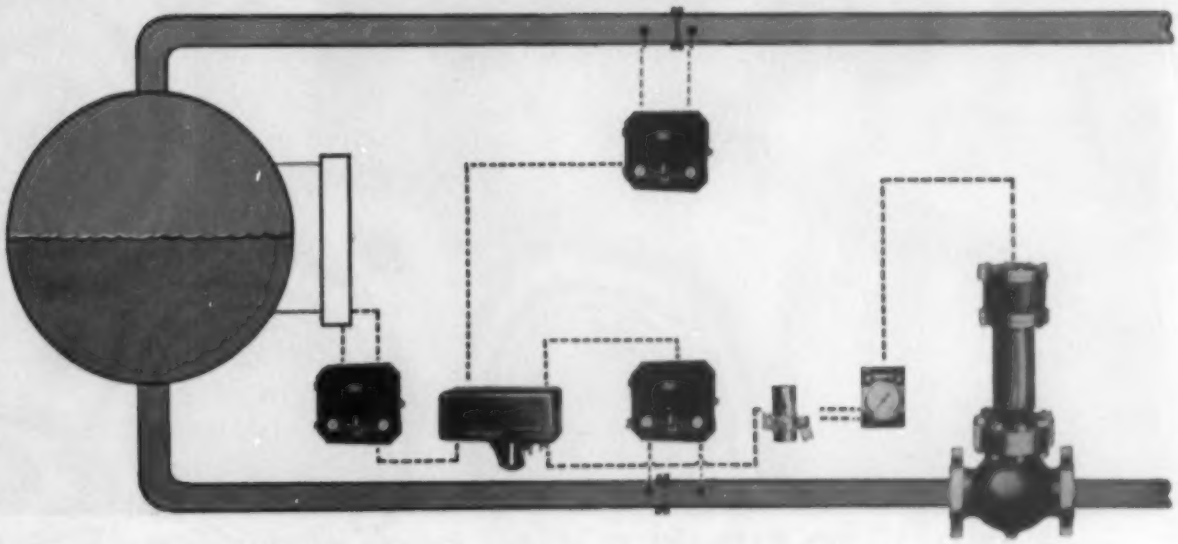
This *NEW* COPES Type 3-L System

offers you a three-influence feed water control that is fast, accurate and simple



Now, from the oldest comes the newest—the Copes Type 3-L Control System by which feed to the boiler is modulated by three influences; steam flow, feed water flow and drum water level.

With it, feed-water input closely matches steam output not only on constant loads but during periods of rapid, wide load changes. Water level is maintained within close limits at all times, regardless of changes in load or feed pressure, and while blowing down or blowing soot.

Due to its simplicity a minimum of instruments is required. Recorders may be omitted.*

Each component of the Copes Type 3-L System is selected for its accuracy and high quality. Every Copes installation is backed by nationwide service, whenever or wherever required, for its entire life.

* Miniature recorders or standard size recorders (by Taylor) can be supplied. COPES Three-Influence Control may also be actuated mechanically or electronically.

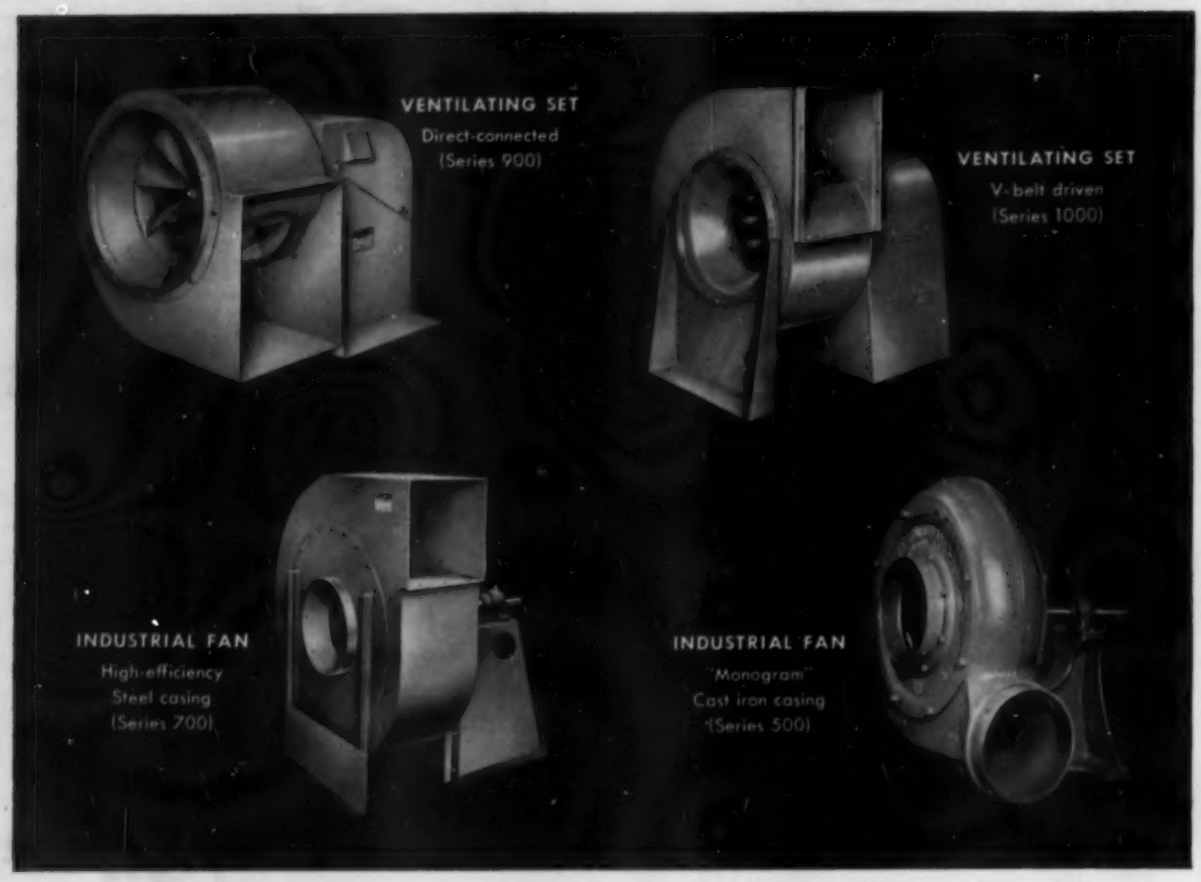
COPES-VULCAN DIVISION

CONTINENTAL FOUNDRY & MACHINE COMPANY

ERIE 4, PENNSYLVANIA

First to develop continuous boiler feeding under automatic control

BOILER FEED WATER REGULATION



These Westinghouse Fans Help You Increase Production . . . Employee Efficiency

Whatever your air handling problem . . . smoke, fumes, vapor, dust, wood shavings, granular material or ventilating . . . these Westinghouse fans are designed to handle or remove them . . . efficiently and economically.

INDUSTRIAL FANS (SERIES 700) . . . for dust collecting and conveying at high pressure. Wide range of capacities. Three types of wheels in 11 sizes.

1. Air Handling Wheel . . . particularly adaptable for general air handling and exhaust systems in removal of smoke, fumes and gases.

2. Material Handling Wheel . . . designed specifically for grinding and buffing wheel systems, and conveying materials such as chips, sawdust and grains.

3. Long Shaving Wheel . . . handles long fibrous materials that pass through the fan itself: trimmings from corrugated boxes, alfalfa, long shavings from woodworking machinery, rags, others.

INDUSTRIAL FANS (SERIES 500—MONOGRAM) . . . ruggedly built, with cast iron casing. For use as a blower or exhaust or for dust control, collecting and conveying waste or raw materials, supplying air for furnace blast, drying, etc. Provides long, trouble-free service at low cost under severest operating conditions. In 10 sizes with wide range of capacity.

SERIES 900 VENTILATING SETS . . . compact, efficient, direct-connected and ready-to-run. Especially suited for small ventilating installations. Cleanable radial blade wheel design minimizes problem of handling airborne dirt and grease. Six sizes from 6" to 15" wheel diameters.

SERIES 1000 VENTILATING SETS . . . V-belt driven, self-contained. Install indoors or outdoors in a wide variety of heating, ventilating or air conditioning applications. Twelve sizes from 9" to 30" wheel diameters.

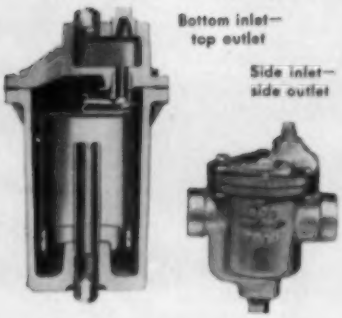
These rugged, powerful Westinghouse fans provide the most economical solution to your specific air handling problem. And Westinghouse fans offer a *single equipment warranty* with undivided responsibility . . . an *exclusive* Westinghouse-Sturtevant feature. Get the facts today on the fan built for *your* need from your nearest Westinghouse-Sturtevant office. Or write: Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Mass.

WESTINGHOUSE AIR HANDLING

J-80360B

YOU CAN BE SURE... IF IT'S Westinghouse

The Steam Trap with a Heart of "Gold"...



Corrosion- and wear-resistant materials; "frictionless" leverage; precision workmanship — add up to LOW MAINTENANCE.

The exterior of the Armstrong trap pictured above sure looks rough, but inside it has a heart of "gold" for its owner, Chemicals, Inc., Chicago, makers of zinc chloride.

Fuel Saving—coal consumption has been cut ½ carload per month since installing Armstrongs to drain kettle coils.

Time Saving—processing time has been cut from 5 days down to 3 days on one zinc chloride tank since installing an Armstrong trap on each of its three coils.

Maintenance Saving—occasionally holes are eaten right through submerged steam coils, allowing acid to get into traps. The stainless Armstrong mechanisms have withstood this abuse successfully. Trap maintenance generally has been negligible. The trap shown above has been on the job working perfectly for five years without repairs.

Take a tip from Mr. Stanley Nykiel, plant operator, who says *"I've tried other kinds, but Armstrongs work best."* Call your local Armstrong Representative (see classified directory or Thomas Register) or write:

ARMSTRONG MACHINE WORKS
806 Maple Street • Three Rivers, Michigan

Application Engineered

ARMSTRONG STEAM TRAPS

SEND FOR CATALOG J

The 44-page Steam Trap Book gives complete trap data and prices plus useful selection, installation and maintenance information. Armstrong traps also catalogued in Sweets and Chemical Engineering Catalog.

S15

Nothing Succeeds like Success

. . . Buell 'SF' Electric Precipitators PROVE IT AGAIN!

Spectacular on-the-job performance started engineers talking . . . and it's been music to our ears ever since.

Our engineering friends have marvelled at low maintenance costs . . . at brand new efficiency records . . . at the wide range of different and complex dust recovery problems that are being solved by Buell's 'SF' Electric Precipitators.

We will be happy to demonstrate the finer points at any time. Such standard Buell features as continuous rapping . . . convenient remote control from a central switchboard . . . the proved efficiency of the exclusive Buell Spiralectrode, are all elements of simple overall design.

Dozens of Buell 'SF' Electric Precipitators are already operating or in the works. Get the complete facts now. Write for our informative Brochure "The Collection and Recovery of Industrial Dusts" which tells about *all three* Buell Systems of industrial dust recovery. Write today! Buell Engineering Company, Department 80-C, 70 Pine St., New York 5, N. Y.

buell®

MECHANICAL ELECTRICAL

20 Years of Engineered Efficiency in
DUST RECOVERY SYSTEMS

High Pressure Answer Men

Increasingly high pressures and temperatures used in processes today demand the most advanced engineering and metallurgical treatment of the piping and equipment to handle them. The M. W. Kellogg Company has earned a long-standing reputation in this specialized engineering area.

Largely responsible for M. W. Kellogg's position is the company's "Committee on Materials and Fabrication" which meets regularly to discuss developments of pure and applied research as they concern service experience, metallurgical progress, welding techniques, and improved methods of fabrication.

Composed of principal engineers from M. W. Kellogg's process engineering, mechanical engineering, and construction departments, as well as the Fabricated Products Division, this Committee benefits all of the company's activities and the facilities they offer in their respective fields.

The Committee on Materials and Fabrication is one reason why The M. W. Kellogg Company is recognized as the leader in the design and fabrication of piping, pressure vessels, heat exchangers, waste heat boilers, and process equipment requiring transient and maintained pressures and temperatures.

M.W. Kellogg

ENGINEERING FOR TOMORROW

THE M. W. KELLOGG COMPANY, NEW YORK 7, N. Y.

The Canadian Kellogg Company, Limited, Toronto • Kellogg International Corporation, London

SUBSIDIARIES OF PULLMAN INCORPORATED

ANNOUNCING

the new 1955 G-E

RM power transformer

A COMPLETELY RE-DESIGNED TRANSFORMER... WITH INSTRUMENTS GROUPED IN ONE EASY-TO-READ CONTROL CENTER... PLUS MANY OTHER NEW FEATURES YOU'VE ASKED FOR

Now a complete re-design of General Electric's entire RM (Repetitive Manufacture) line of power transformers brings you many new features that mean easier installation, less maintenance and longer life.

In the new 1955 line of RM transformers, for example, all instruments are grouped in one convenient location. Called the "control center," this unique arrangement improves visibility and simplifies maintenance. Recessed behind the cooling tubes, all accessories including the tap changer operating handle are protected against accidental damage. All are safely accessible even with the transformer energized.

Many new money-saving features of G.E.'s 1955 RM transformer line resulted from product planning meetings with more than 75 electric utilities. Such things as American Standard bushings, weather-tight conduit, extra jacking space, and pre-fitted arrester-to-bushing connectors were first suggested by the men who actually use and install transformers.

The 1955 line has also been re-designed to give you a transformer of even greater reliability. Use of Formex* wire, for example, results in a smaller, lighter, yet more dependable unit. All single-phase transformers feature improved performance because of Spirakore* construction which gives you the full benefit of the directional properties of grain-oriented steel.

Your acceptance of power transformer standardization has made this new transformer possible. Available in ratings 501 to 5000 kva single phase and 501 to 10,000 kva three phase, 69 kv and below, 1955 RM transformers are being built at Rome, Georgia, on the nation's only real "mass production" line for power transformers. To see how these new transformers can benefit you, just get in touch with your nearest G-E Apparatus Sales Office or write for Bulletin GED-2505. Address your request to Section 416-1, General Electric Company, Schenectady 5, New York.

*Reg. trademark of General Electric Company

Progress Is Our Most Important Product

GENERAL ELECTRIC

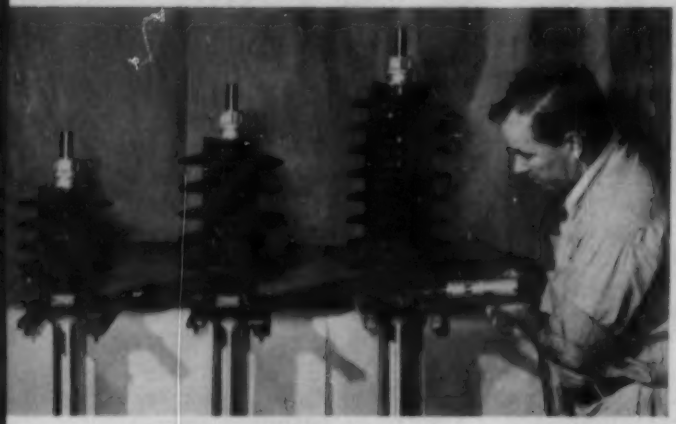
To See More of the Advantages of G.E.'s New RM Transformer for '55

TURN PAGE→

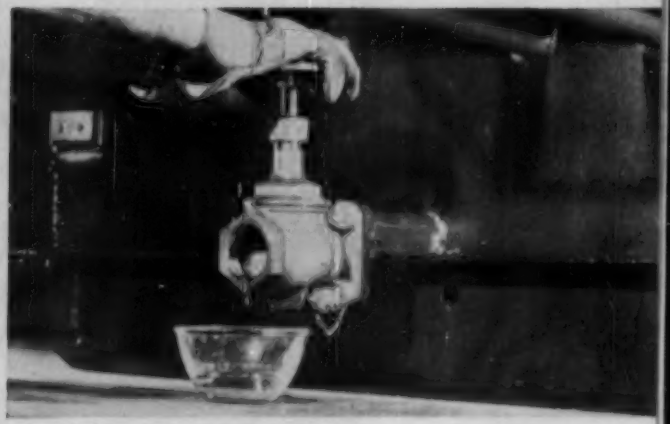
SKI-TIP BASE on '55 model mounts rollers smoothly for faster, easier installation.

EXTRA JACKING SPACE saves time, permits use of most jacks available in the field.

G.E.'s new 1955 RM trans-



AMERICAN STANDARD BUSHINGS on all '55 units will eventually help reduce your bushing inventories.



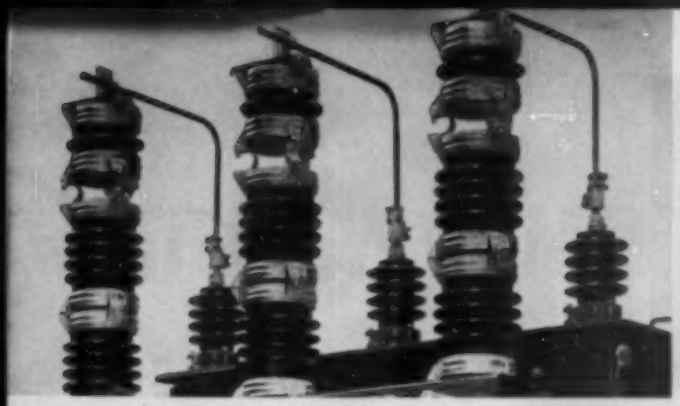
FULL DRAIN allows you to filter **all** the oil. Result: more effective filtrations, more accurate sampling.

has many features that

DOMED COVER sheds water to help prevent rusting on top of the transformer.

WEATHER-TIGHT CONDUIT and fittings keep out water, yet are quickly assembled without cutting threads.

and give longer service life



PRE-FITTED CONNECTORS between arresters and bushings save time and expense of fabricating in the field.

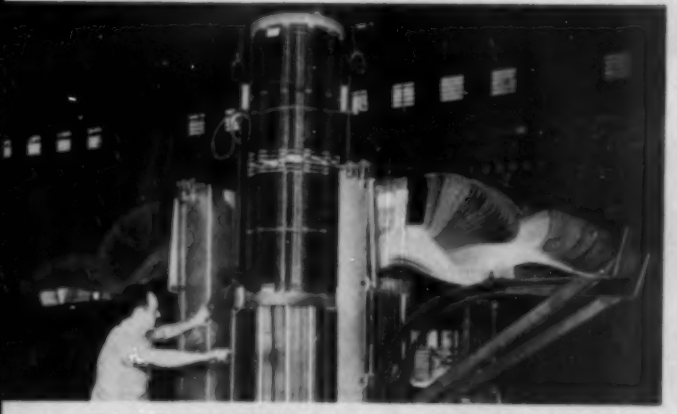
FORMEX° WIRE (right) more rugged than paper and tape also reduces transformer size and weight.

former is easy to install

RE-USABLE NITRILE GASKETS, applied throughout 1955 line, require no cement, are easily used over and over again.

SUPER MELAGLYP FINISH—flow-painted on—gives the 1955 G-E transformer superior rust protection.

reduce maintenance costs



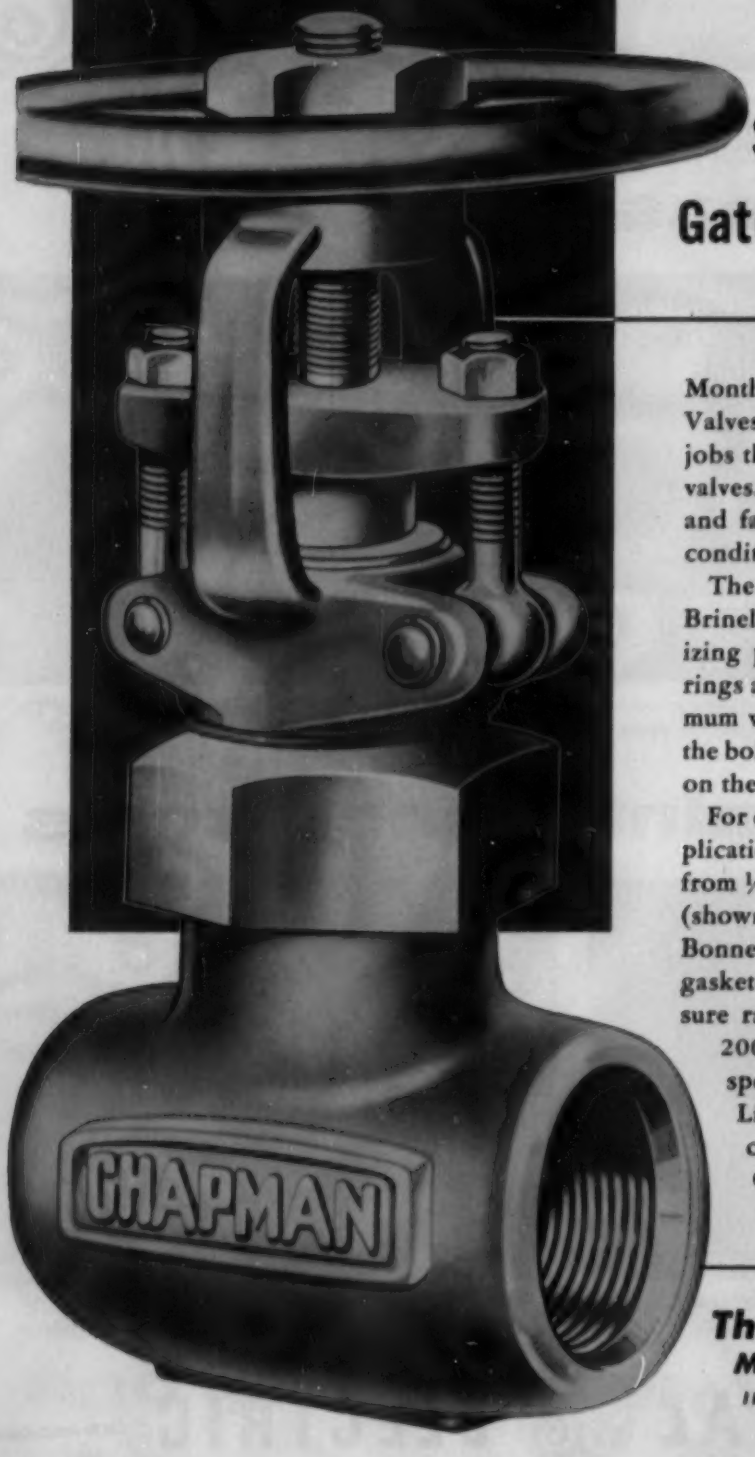
SPIRAKORE° DESIGN gives improved performance to all single-phase transformers in the 1955 line.

°Reg. trademark of General Electric Company

ADJUSTABLE COIL CLAMPS tighten windings after drying, keep coil stack rigid to resist mechanical stresses.

GENERAL ELECTRIC

Chapman List 960



...for EVERY Small Forged Steel Gate Valve Application

Month after month, Chapman List 960 Valves deliver the goods on more different jobs than any other small forged steel gate valves. And maintenance charges are few and far between even under the toughest conditions.

The wedge gate faces — hardened to 800 Brinell by Chapman's exclusive Malcomizing process — won't seize or gall. Seat rings are hardened stainless steel, for minimum wear, and are easy to replace. Also, the bolted follower has no exposed threads on the yoke to corrode.

For every small forged steel gate valve application, specify Chapman List 960. Sizes from ¼″ to 2″, either rising stem with yoke (shown) or rising stem with inside screw. Bonnet joint is ground metal-to-metal or gasketed, depending on application. Pressure range is from 380 psi at 1000°F to 2000 psi at 100°F. For higher ratings, specify List 990.

List 960 is made in various alloys and combinations of alloys as listed in Catalog No. 10. Write for your copy today.

The CHAPMAN Valve
Manufacturing Company
INDIAN ORCHARD, MASSACHUSETTS

TIMELY COMMENTS

More Goods—More Dollars

WE CAN assume that sometime the present rate of building new plants will slow down. There will come a time when the nation's productive capacity is ample to meet consumer needs. This does not indicate, however, that engineering activity and the sale of manufacturing equipment will decline.

There is no indication that wages per man-hour will decrease; and this high wage rate may constitute a part of the answer as to how high industrial activity may continue. To maintain even the present output of consumer goods necessitates high earnings, high buying power.

Therefore to keep playing the game—at a profit—the consumer goods manufacturer must seek better methods. He must continually devise means of getting more output per worker. That means plant changes: improvements, and modernization. Thus engineering and plant betterment activity may continue at the present high pace, even in the face of flattening consumer demands.

Engineers will continue to see needs for betterment of existing plants, and equipment manufacturers will continue to offer better replacements for existing equipment.

Today's obsolescence rate is high. It is not based on wear or age—and not necessarily on increased maintenance. Existing machines become obsolete as soon as better machines become available. Therefore equipment sales appeal will be determined by performance. Performance will be determined largely in terms of finished goods per dollar of payroll. Economy of materials will continue important, but in most cases the customer will be sold because of labor savings.

Industrial eyes are focused on improvements more than ever in the past. Capacity in many plants is now adequate, but costs are too high. Any machine or device that will reduce cost will be given serious consideration by profit-minded Southern manufacturers.

Big Jump in Steam Pressure

Abstracted from The Engineering Outlook by J. R. Carlson, Engineering Manager, Steam Division, Westinghouse Electric Corp.

FOR YEARS, the critical pressure of steam—or the pressure above which water and steam have the same density—has been thought of as a sort of ceiling or upper limit upon practical operating steam pressures. But theoretical studies and experiments have now indicated that steam plants operating at more than 1000 psi above the critical pressure are entirely practical. These super-pressure plants, as we have chosen to call them, offer the best possibilities today for generating electricity at substantially higher efficiency.

Development work must be done; new problems must be recognized and solved; and known phenomena must be more thoroughly understood and investigated in the process of building the first super-pressure steam turbines. All these will undoubtedly lead to improvements in turbines of all sizes and for all steam conditions.

The "tops" in tandem compound steam turbines built today is a 250,000-kw unit having initial steam conditions of 2400 psig and 1050 F, with reheat to 1000 F. It exhausts at a pressure of 1.5 inches Hg. Any small increase in throttle pressure which would closer approach the critical (3206 psia) pressure would introduce several problems in steam generator operation and control. But by taking the long step to 5000 psig, we go well into the super-pressure region and sidestep such problems.

Designing and building a turbine for such conditions involves only fitting a small super-pressure turbine ahead of a conventional machine, which may be cross- or tandem-compound. In the 275,000-kw Philadelphia Electric turbine Westinghouse is now designing, steam will enter the turbine throttle at 5000 psig and 1150 F, and will have two reheats to 1050 F. Thus, by taking the "big jump," new problems of designing for higher temperatures, pressures, thermal expansions and mechanical stress levels are concentrated in the small super-pressure unit.

BORDEN MANUFACTURES EVERY TYPE FLOOR GRATING

IN FERROUS AND NON-FERROUS METALS

BORDEN ALL-WELD DESIGN

The best type for use where floors are subject to extreme corrosion or moisture — chemical plants, breweries and other process industries. There are no cracks, open joints, or holes in bars. This type made only in mild steel.

BORDEN RIVETED DESIGN

Most substantial and oldest design of grating made, permits perfect distribution of loads. Made on the truss principle, Borden Riveted Gratings are hydraulically power-forged for strength and durability. Particularly recommended for aluminum.

BORDEN PRESSURE LOCKED DESIGN

Neat, clean, durable, easy to paint and maintain. Pressure Locked Design permits maximum passage of light, heat and air. It is especially desirable in power plants, boiler rooms and all dry area. Deep cross bars increase lateral support.

SEND FOR FREE CATALOG COVERING ALL FLOOR GRATINGS

BORDEN METAL PRODUCTS COMPANY

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INDUSTRY SPEAKS

SOUTHERN POWER AND INDUSTRY

ATOMIC ENERGY . . Its Role in Florida's Future

Excerpts from a recent talk by DEAN JOSEPH WEIL, College of Engineering, UNIVERSITY OF FLORIDA, on the potential impact of nuclear energy on the industrial expansion of Florida.

IT IS surprising how few well-informed persons have any cognizance of the true size of manufacturing operations in Florida. How infrequently, after giving the above statistics for agriculture and then propounding the question: "What then do you consider to be the value of the products manufactured in Florida?" do I receive an answer that indicates the comprehension of the true picture.

Back in 1937, the value of products manufactured in Florida totaled $217,000,000. For the year 1952, that figure becomes $1,275,000,000. Thus while the value of agriculture products has increased 250%, industry has increased 500%.

Florida Fuel Costs Are High

Florida has, it seems, almost everything for an industrial expansion of tremendous magnitude. Only one thing is missing, and that is fuel for energy.

While it is true that for many industrial processes the cost of energy for production is only a small part of the total cost of manufacturing the product, it is also true that energy in the form of heat is an important part of the cost of producing many other products. The great industrial centers of our nation are not far removed from important sources of fuel supplies.

It is my definite feeling that many of the processes which will become a part of the increased manufacturing expansion of Florida in the future are greatly dependent upon large quantities of heat. It is likewise my belief that if a cheap source of fuel were available, the entire living conditions in our State would be materially changed.

I visualize the time when, because of the availability of heat energy at low cost, your homes will be heated in the winter and cooled in the summer by heat that is brought to you in the same manner that wires now bring you electricity. Nor will your plants in many cases have their own boilers for generating heat, but this, too, will be brought to you through available heat lines and metered accordingly. The availability of such energy will give an industrial expansion that would cause an impetus in the use of electrical energy beyond anything that we now can see.

I share the belief of many of the industrial leaders of the nation that within three to five years nuclear energy will become available to industry. Nuclear energy is in effect a weightless fuel. A pound of uranium 235 contains more than a million times the energy of a pound of coal. A cubic inch, if operated at 100% efficiency, would operate a thousand kilowatt generator for a year. A mass equivalent to the size of a person's head would furnish the electrical energy used by the city of Tampa for a year, assuming 100% efficiency.

Florida is one of the three states of the country having the highest fuel cost; therefore it **stands to benefit most from such a development.** It is of particular interst to recognize that one of the great sources of nuclear energy, uranium, is found within a short distance of Tampa. I am sure that all of you are aware of the potential production of uranium from our phosphate plants. A recent article referred to Bartow, Florida, as the uranium city. The picture is most interesting. For from these phosphate plants the Government is now extracting as a by-product uranium oxide, otherwise known as U-308, to be sent to the government plants for processing. An estimate indicates that from a ton of phosphate ore, on the average less than a quarter of a pound of uranium oxide is secured, and yet when it is recognized that in 1952, 39 million tons of phosphate ore were mined, it would mean (based on this quarter pound figure) that approximately 10 million pounds of U-308 could have been recovered.

Certainly, only a small percentage of these 10 million pounds is recovered in the final form of uranium. Then it must be understood that from this uranium only approximately 7/10 of 1% will be in the form of fissionable material, U-235. In other words, from the 39 million tons—78 billion pounds—of phosphate ore mined, only a few thousand pounds of U-235 could be produced. But of course each pound would be about as effective as 1300 tons of coal.

Truly we come into a new age. An age that might be called the age of unlimited mechanical energy. It is an age that throws a challenge to our State and its leaders. We can follow or we can lead. We can wait until others make the developments and take the initiative, leaving to us the leftovers, or we can pioneer and with imagination, resourcefulness, and initiative blaze the trails that would give to Florida leadership in this new endeavor.

REDUCE PLANT CORROSION LOSSES

Systematic Analysis Points the Way to Savings

By EDWIN C. WHITE, Project Engineer

Celanese Corporation of America, Rock Hill, South Carolina

THE AUTHOR—Mr. White is a native of Pennsylvania and was graduated from Haverford College as a Mechanical Engineer. Early employment included work as an instructor of assemblers for the Royal Typewriter Co. and as a designer of special controls for the Automatic Cone Valve Division of the Chapman Valve Manufacturing Co.

In 1941, he joined Celanese at a plant near Narrows, Virginia, working first on installation drawings for equipment and piping, and later supervising installation and maintenance of chemical plant equipment for producing 125 million pounds of cellulose acetate per year. In 1948, he was transferred to the Celriver Plant of the company, then under construction near Rock Hill, South Carolina. In his present position of Project Engineer, he is responsible for engineering design, estimating and coordination of extension or revisions of plant facilities.

THE FIELD of corrosion control is one which increasingly affects all engineers, since the savings which can result from the right solution to corrosion problems are so great that no engineer concerned with the construction, operation, or maintenance of plant equipment can ignore this field. The total loss to American industry from corrosion of all kinds has been estimated at six to eight billion dollars per year.

Research progress in the field of the process industries—the development of new and better methods in the production of synthetic chemicals, plastics, and textiles—requires constant reexamination of the materials available for the construction of plant equipment. To insure the best control of quality and maximum economy of labor, fuel, and raw materials, large investments in automatic controls and complex, specially engineered equipment are justified. But there is a big "if" in a modern plant, specially designed for a new or improved process: What materials of construction must be used for the equipment in order to provide reasonable life without excessive first cost? The large investment in modern plants requires operation at maximum production rates, with minimum shutdown for maintenance and repair.

Corrosion can take a heavy toll in loss of production from process equipment and in excessive cost of repair and replacement. As long as processes could be carried out in a few simple batch kettles, complete replacement of equipment as it became unserviceable through corrosion was still one practical method of keeping a plant in operation; but with today's specialized equipment, often designed for continuous processes, this method is impractical in all but a few cases. The basic reason for this change lies in developments in materials of construction which have paralleled the process developments. The engineer faced with the problem of material selection has many difficult decisions to make. The profitable operation of his plant will probably depend in large degree on the correctness of these decisions.

Selection of Materials

Although the solution to a problem of material selection must be based on general principles rather than hard and fast rules, by systematic analysis it is possible to decide on a course of action most likely to produce best results.

As a first step in the analysis, a list should be prepared of all the corrosive agents which may be present, whether they are in liquid or vapor phase, and the temperature range. It is important to know what impurities should be expected, and what secondary reactions or decompositions may occur, since ions present only in trace quantities may contribute more toward corrosion of construction materials than the major constituents of a solution.

A preliminary check of the literature, corrosion handbooks, etc., will often eliminate many engineering materials from the field of choice, and should indicate some which show possibilities of success. The same material may not be suitable throughout the system, because of variations in temperature and concentration of the agents.

The ideal solution is to select materials which will give maximum economy over the useful life of the plant. This frequently requires a compromise between low cost, short lived materials and ex-

pensive, highly resistant ones. The following tables list materials typical of those which might be considered in a preliminary study:

Metals

Aluminum	Lead
Bronze	Monel
Chlorimets	Nickel
Copper	Stainless Steel
Durimet 20	Tantalum
Duriron	Titanium
Hastelloy B	Etc.

Non-Metals

Carbon	Polyvinyl Chloride
Cements	Rubber
Ceramics	Saran
Furan Resins	Teflon
Phenolics	Etc.
Plastics	
Polyethylene	

Metals

Metals are naturally highly favored for fabrication of equipment, and stainless steel has been found to be extremely versatile. The many different stainless alloys available include suitable materials for a great variety of applications. The companies specializing in production of stainless steel have accumulated a great fund of information, and can make helpful recommendations. If there should be unusual conditions for which data do not exist, metal suppliers will often be glad to make special studies.

The wide application and versatility of welding in the construction of equipment warrants a careful look into the field of weldable metals. The advantages of repair or alteration by welding are obvious.

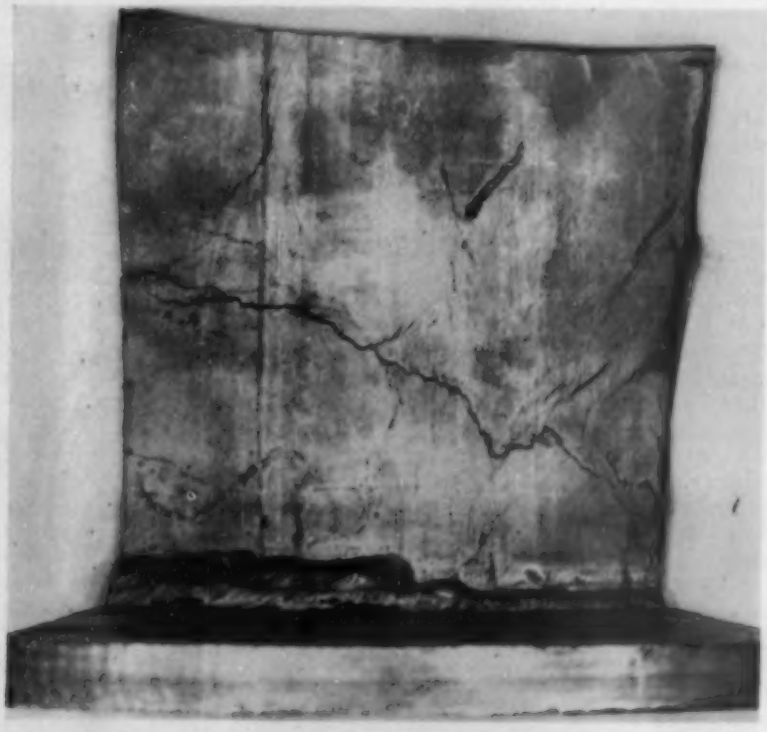
Clad Metals

The use of clad metals should be approached with caution. Cladding involves application to the base metal (usually carbon steel) of a thin layer of a corrosion resistant metal, such as nickel or stainless steel. The cladding may be applied to one or both sides of the sheet and usually amounts to 10% to 20% of the total thickness. The object, of course, is to use a relatively inexpensive metal to provide the structural strength for a tank or process vessel and to reduce the cost of corrosion resistant metal to a minimum. Welds must be made using the corrosion resistant metal.

Where stainless steel is required simply to guard against contamination of the contents of a vessel or to insure cleanliness, and no appreciable corrosion is involved, the use of clad metals may be entirely practical. If corrosive attack may exist, especially in more complex equipment, the use of clad metals is likely to be false economy. Once the resistant layer is penetrated, possibly by a crack or porous area in a defective weld, attack of the base metal may proceed rapidly before it is detected.

Repair of vessels constructed of clad metals may be difficult because the resistant layer is exposed only on the inside. The appearance of leaks on the exterior will not necessarily reveal where they are located on the inside, and repair from the outside is not likely to be satisfactory. The cost of fabricating clad metals is not likely to be less than for solid corrosion resistant alloys, and in most cases the saving in material cost alone will not justify their use when uncertainty of success is weighed.

Actual size. Outside surface of Van Stone joint, showing one heavy crack and a few fine cracks.



Coatings

Remarkable advances are being made in the field of corrosion resistant coatings, but these as well as the clad metals are likely to be successful only in a rather limited field where conditions are favorable. Many coatings will not stand the high temperatures that metals can. The more resistant ones may require baking, and this usually rules out field application.

To be successful, a coating must be impermeable so that none of the liquid in contact with it can penetrate to the metal being protected. The coating should also be an electrical insulator so that electrochemical attack cannot occur; and, of course, it should be completely resistant to any acids, alkalis, or solvents with which it would come in contact.

Resistance to Corrosion

Let us suppose that we have selected several materials which seem to have possibilities. We are then ready for laboratory tests. It is not likely that we will be able to simulate exactly in the labora-

tory the conditions which will be met in the plant; but, nevertheless, the laboratory can provide valuable information at nominal cost.

Samples for test need not be large; strips ½" x 2" x 1/16" thick are a convenient size. Identification numbers can be stamped on one side. A number of samples of each material will permit exposing them at the same time to each corrosive agent at the various conditions to be encountered. Some samples may be immersed in boiling solutions, others in the vapor from these solutions, and still others half in the boiling solution and half in the vapor.

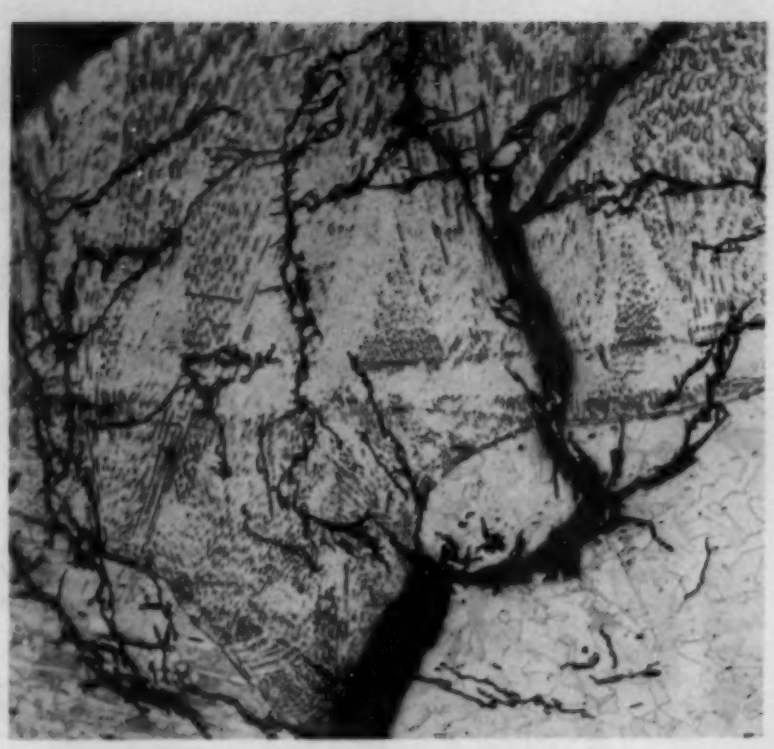
In many vessels it has been found that attack is concentrated just above the normal liquid level, where vapor condenses on the walls and runs back into the hot solution, so that in the laboratory it is often desirable to simulate this condition.

The standard unit for expressing test results is loss of weight in milligrams per square decimeter per day. This enables comparisons to be made of rates of corrosion of the various materials being considered. If desired, the results can be converted to inches penetration per year in order to determine probable rates of thinning of walls of vessels or piping.

Attack will not necessarily result in uniform corroding away of the surface, but may take the form of cracks. Detection of these will probably require microscopic examination. Photomicrographs will be helpful in the study of the condition and for the record.

Special Corrosion Problems

Corrosion is one of the principal engineering problems connected with producing cellulose acetate flake and recovering the unused acid. Resistance to corrosion by acetic acid is an important factor in the selection of materials for construction of equipment, since this acid is present in almost every stage of the process. In the early days, wrought copper and cast bronze components were widely used. Lead, which is so useful in the rayon industry, has no application here, since it reacts with acetic acid to form a water soluble salt.



Oxalic Etch, 100X. Photomicrograph of transgranular cracking, originating from crevice in angle joint.

While copper is excellent for concentrated acetic acid with little oxygen present, it is aggressively attacked by dilute or aerated acid. Under severe conditions, replacement of equipment can be frequent and costly. So the development of austenitic stainless steels, the high chrome-nickel types, was welcomed with open arms and these alloys were widely applied to replace copper. However, stainless steel is not a cure-all, and can be very sensitive to conditions of fabrication and use.

At ordinary room temperature, Type 304 stainless steel containing 18 per cent chromium, 8 per cent nickel, and less than 0.08 per cent carbon, is satisfactory for acetic acid. Above 130 F this alloy becomes more susceptible to attack, but Type 316, containing 2 to 3 per cent molybdenum, is normally resistant.

Both may be susceptible to intergranular corrosion if heated in the sensitive zone—800 to 1600 degrees—during fabrication. This heating causes precipitation of chromium carbide at the grain boundaries, leaving adjacent areas low in chromium and subject to attack. This condition can be prevented by heating the work to 2050 degrees and cooling quickly by quenching. The heating restores the carbides to solution in the grains, and the quench anneal stabilizes them there.

Welding, which keeps the temperature of the metal in the critical zone for a half minute or more, may be detrimental. To avoid this, we weld with stringer beads only, and permit no weaving on stainless steel. Sometimes the electrode is promptly followed by water cooling to make sure that the temperature is reduced below the critical range in less than a minute.

We have also had failures of stainless steel by transgranular cracking in contact with acetic acid. This is evidence of stress corrosion, which occurs only in the presence of chlorides. Since even a trace of chloride can be enough to give trouble if high tensile stresses exist in stainless steel components, extreme care in fabri-

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Vacuum System Helps Dust Collectors Clear Cork Refuse from Delaware Plant

A SAFER plant, better working conditions and lower insurance rates are the three-fold advantages realized by the Wilmington, Del., plant of Bond Crown and Cork Co. from a central vacuum system that cleans up cork dust from the cork processing area.

This plant of Bond Crown and Cork, a division of Continental Can Co., produces about 100,000 gross of bottle caps per day. Approximately 50 tons of cork are used daily to make the cork discs that line the inside of the bottle cap. The cork, which is received in chunk form, is chopped, ground and screened to produce particles of uniform size. These are mixed with adhesive, extrude into rods which are then sliced into the flat discs that go into the caps.

Clean-up operation around a vibratory separator, showing an accumulation of cork particles on the floor. Plug-in connection to the vacuum line is shown. Dust separators that collect the fine dust picked up by the Exidust system are shown in view at right.

Dust Collectors

In this manufacturing process, a considerable amount of cork dust is produced. Each of the various processing machines is vented into a dust collecting system, in which nearly 3000 pounds of cork dust is collected per 24-hour period. Efficient though these collectors are, they are unable to cope fully with the large amount of very fine dust generated in the grinding and screening operations. These fines hang as a fine haze in the air and eventually settle on the floors, eaves and building trusses in the processing area.

Because cork is a combustible substance, this finely divided dust, if allowed to accumulate, presents an explosive hazard of some consequence — nearly equivalent to that of corn starch.

Vacuum Cleaning System

To keep the concentration of dust down to a safe level, Bond has instituted a carefully scheduled housekeeping program using an industrial central vacuum cleaning system developed by Lamson Corp. The system consists essentially of a motor-driven exhauster, a circuit of metal piping that carries the vacuum in the plant, and a set of separators where the dust is collected for disposal. The vacuum piping is

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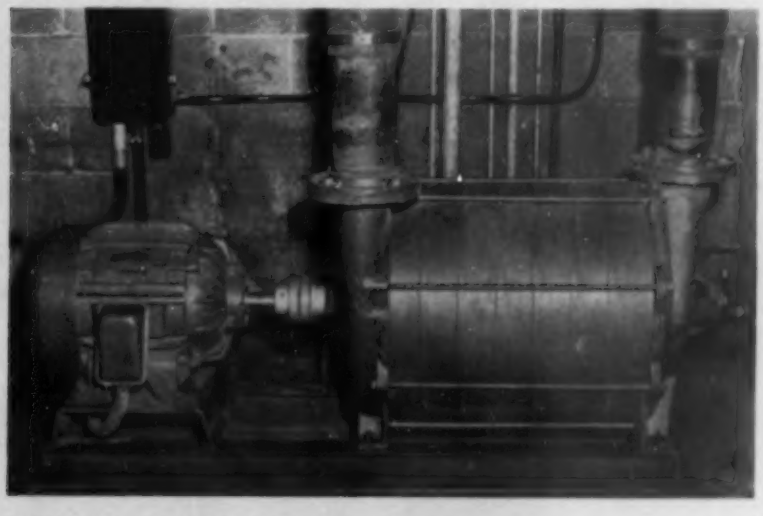


Motor and exhauster assembly that creates the vacuum for the Exidust system.

Troubles and more troubles in Carolina plant . .

How We Cured Our Cooling Tower Troubles

By SAM BOYER
Wisteria Hosiery Mills, Inc.
Gastonia, North Carolina

HERE is the top ball bearing flange unit which wore out in exactly 3 weeks. Mechanic points to defective part.

WE WERE having plenty of trouble with the fan and drive of our induced draft cooling tower over a period of several years.

First we burned out the original 5 hp motor which operates the 72 in. fan at 465 rpm. Then both top and bottom units of ball bearings broke apart and completely demolished the fan blades and hub assembly, although the bearings were carefully lubricated at recommended intervals with approved lubricant.

After repairs were made and the tower was in operation for a short period of time, the rewound motor again burned out. This time it was replaced with a new Triclad motor. This sort of maintenance program went on for about 5 years during which time several new sets of ball bearing flange units, and a new 5 hp General Electric All-Weather motor were installed.

Many Troubles

The replacement of bearings, motors, and fan were not the chief items of expense, however, because the cooling tower had a very important function which it frequently failed to perform. When the tower was out of order because of broken parts, the 300 gpm condenser to our 100-ton turbo-vacuum compressor was lacking and the entire air-conditioning system for Wisteria's Knitting Department had to be stopped. Of course, this automatically closed the knitting department. Overhead expenses always continue under the circumstances.

But this was not the least of our troubles. The howling noise from the cooling tower bearings and fan, when it was in operation, so annoyed the neighborhood around the plant that many protests were received. For instance, one irate housewife called a supervisor at the plant and stated that if the cooling tower could not be fixed so that she and her husband could sleep at night, she would "get an ax and cut the darn thing down to the ground."

Certainly, we asked for engineering service and advice; but we were merely told to put in another set of bearings, or have the motor rewound if it was necessary.

However, the planned installation of the same type new ball-bearings was not made even though they had been received in shipment complete in the flange cartridges. It seemed ridiculous that we should continue to install new bearings every few weeks or months, and then have the motors burn out because of bearing failure.

Problem Analyzed

Accordingly, we ordered the repair work stopped until we could contact an application engineer from a major bearing distributor, namely, Carolina Bearings, Inc. This company represents many of the outstanding manufacturers of

DAMAGED ball bearing is shown in the center, with new bearings on either side and approved lubricant in rear. Photo at right shows bearing housing, which supports the entire weight of the driven fan mechanism.

ball, roller, and thrust bearings, and we felt that they would be in position to give us a fair and impartial opinion when consulted about our problem.

We then made a thorough examination of the cooling tower fan and both the top and bottom flange units. We found the flange units equipped with a standard type wide inner ring ball-bearing, having a mechanical seal which throws off excess grease and dirt —a nice feature for a cooling tower bearing. According to the manufacturers' service manual, the ball-bearings had a radial load rating of 3065 lb, and were designed for ease of application on radial loads. They absolutely were not the angular-contact type of ball-bearings recommended for thrust loads.

Referring to illustration number two. It is apparent in the photo that the bearings must carry a heavy thrust load, because the drive-shaft is mounted in a vertical position. They must carry the weight of the 18-in. drive-pulley on top (removed), the weight of the shaft itself, six fan blades, heavy fan hub and guard, and the nuts and bolts to hold them in place. The total dead weight of the above parts is approximately 200 lb and must be supported entirely by collars resting on the inner rings of the top and bottom roller bearings.

An examination of the discarded ball-bearings (one of which is shown) shows excessive wear and pitting along the bottom edge of the outer race. This is conclusive evidence that the bearings were subjected to a heavy thrust load, a service for which they were not designed.

MECHANIC makes final adjustments to the bolts which secure the individual fan blades. Cost of parts and machine shop work was only about $75. Installation was handled by Wisteria's maintenance mechanics.

By using the simplified formula furnished in the service manual of The Shafer Bearing Corporation, we were able to compute the radial load on the bearings of the cooling tower. The primary radial load, due to the V-belts being applied to the pitch diameter of the 18-in. driving pulley amounted to 100 lb. This was multiplied by a constant of 1.5 to allow for medium tight belts. The radial load was only 150 lb, as the fan had been very evenly balanced.

We could not accurately compute the thrust load, as some factors were lacking. However, the pitch of the fan blades, speed in rpm, moisture content of exhausted air, amount of air lifted in terms of cfm, plus dead weight of driven mechanism (200 lb) were roughly estimated at 1000 lb due to moderate shock in operation. We used these figures as a yardstick in selecting suitable replacement bearings.

The application engineer recom-

(Continued on page 99)

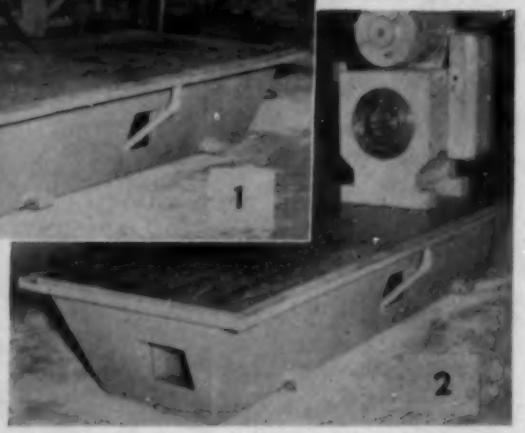
Engineers make Mississippi visit pay off . . .

SHORT ORDER PRODUCTION

By C. V. HOGAN

This brief discussion between Bill and Ed gives some direct production hints. But, more important, it points out how to gather technical information and report results with the aid of photographs.

No. 1
Photograph of Bed



No. 2
Head Stock

Bill:

Good morning, Ed. How was the trip?

Ed:

Fine, Bill, and boy am I excited! Do you remember a few days ago when we were discussing this contract for the large gear blanks?

Bill:

Yeah, Ed, I remember. We had to turn it down because it was outside the capacity of our equipment and, if you remember, top management said at the time that buying machine tools for such short order jobs was out of the question.

Ed:

Yeah, that's what I'm excited about. I was down in midwest Mississippi at the LeTourneau Company for a couple of days and I believe that they have about as practical and workable approach to this short order production problem as I have seen.

Bill:

Well, let's hear about it, Ed.

Ed:

Well, Bill, these boys down there have designed and standardized on a few basic units of machinery that they use in their production departments that have virtually eliminated this problem that we are fighting. They call them Tournamatics. I understand that this is because the idea of the units came from Mr. R. G. LeTourneau, the president of the Company.

I knew you would be interested, so I took a few snapshots to show you. Now, I'm not advocating that we need to go into this thing as deeply as the LeTourneau Company has, because they have been using them for years. They even make their own motors, gear boxes, and just about the whole works.

Now, Bill, let's look at a few of these snapshots. Take this one of the Tournamatic bed for instance.

Photograph No. 1

These beds are made of fabricated steel and are very rugged. The inside of the bed serves as a coolant reservoir. You will notice that the top of the bed has drilled and tapped holes over its entire surface. This bed is used for the foundation or base for about 85% of these machines.

Bill:

Yeah, Ed, and I can see it would be pretty simple to build, too.

Ed:

That's the keynote to the whole system, Bill. The very simplicity of the equipment is what interests me. Boy, if you could see what they do with this equipment you still wouldn't believe it!

Now, Bill, let's look at one of their standard head stocks.

Photograph No. 2

Bill:

Man, look at the size of that spindle! They must have about 14" bearings on that baby.

Ed:

Yeah, and they are taper roller bearings, too. That head has enough stuff built into it so a man can move some metal.

Bill:

I suppose you are going to tell me this is also a fabricated structure?

Ed:

Right again, Bill. And again, the simplicity of the structure is fascinating.

Now let's look at one of their slides.

Photograph No. 3

Now here, Bill, they use for the base of the slide a cast steel base and they even flame harden the ways. The saddle on top of the base is cast iron and they say they have been running for years. I didn't take a shot of all the different types of slides they had, but you can get the idea from this one. They have them operated by air, hydraulics, or mechanical. This particular slide is operated by air.

Bill:

Well, Ed, what do they do with these units?

Ed:

I was getting to that, Bill. I have some shots of different ways they assemble these units for special jobs and you will get the whole idea of the versatility of the system they use.

First, I took this shot of the product they run on the equipment, and also this shot of the machine. Outside of the standard units, this machine consists of the tool holders and a simple fixture attached to the spindle.

Photograph No. 4
Photograph No. 5

Also, I shot this picture of a machine that has a special compensating chuck attached to it for centering the part they call a C-3 spider.

Photograph No. 6
Photograph No. 7

You will notice how they have arranged cylinders on the cross slides for hydraulic power feed.

Now this one has a splined collet on the spindle and actually chucks by the pitch diameter of the part. This is to insure that the pitch diameter is absolutely

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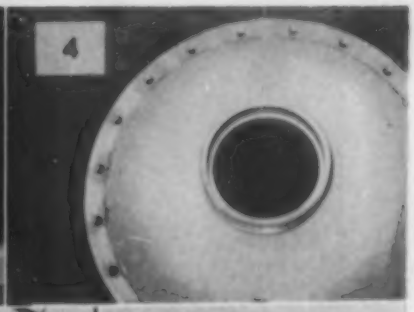
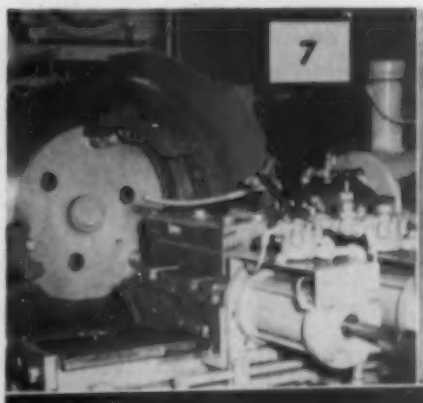
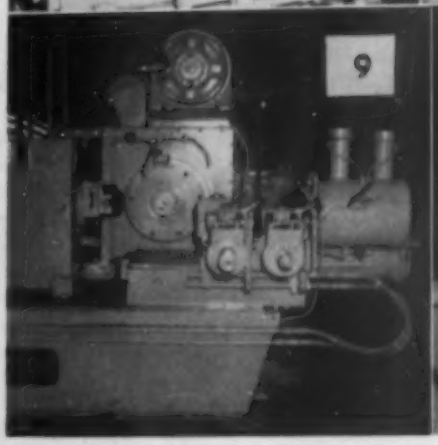
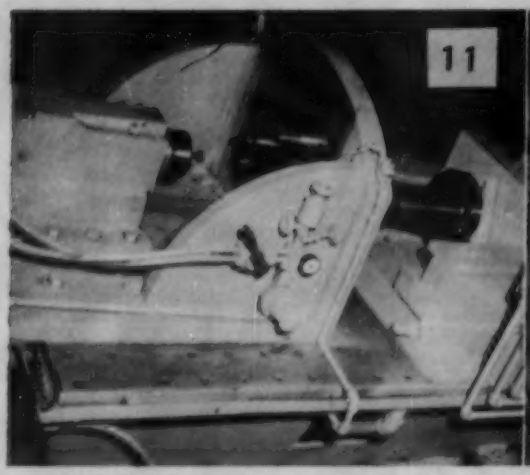


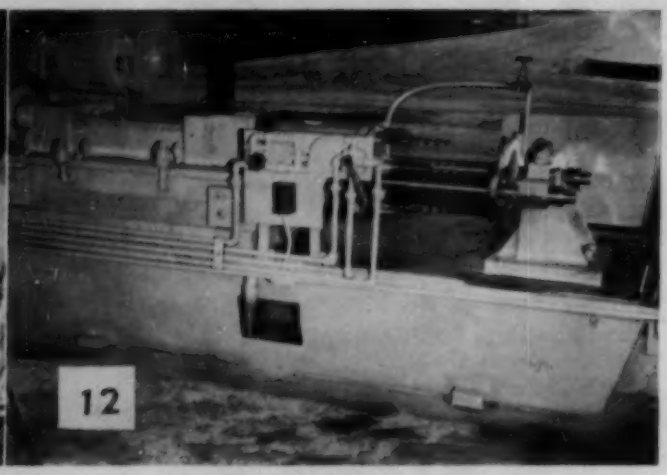
No. 3 Photograph of Slides
No. 4 Hub & Disc Straightener
No. 5 Hub & Disc Machine
No. 6 Photograph of C-3 Spider
No. 7 Spider Machine Operation
No. 8 Photograph of Spider
No. 9 Spider Machine Operation
No. 10 Traveling Tournamatic







No. 11 Finish Bore Machine



No. 12 Multiple Spindle Drill

true with the other machined surfaces.

Photograph No. 8
Photograph No. 9

Now on this machine, they finish bore the bearing holes in this spider. I forgot to mention I have a picture here of one of their standard units that they call a traveling Tournamatic.

Photograph No. 10
Photograph No. 11

You will notice that the bearing housing and spindle assembly move out as a unit. It is hydraulically operated and is very versatile as is portrayed in this photograph of a multiple spindle drill that uses one of the standard traveling Tournamatics as the basic power unit.

Photograph No. 12

Well, Bill, what do you think? Doesn't the idea look like exactly what we need to combat this short order production problem?

Bill:

Yes, Ed, the idea looks great, but what about the cost of all these units?

Ed:

Well, of course it would cost a little money to get started, but you can't even begin to realize the potentials in this equipment until you have seen them in operation and the beautiful part about it is the equipment can be operated with semi-skilled labor and when the job is done the units can be rearranged into still other special production set ups without the tremendous cost of special set ups.

Bill:

Yeah, it's beginning to hit me, Ed. When you finish with a special machine you convert it into another special machine, using the same components. Boy, that really has got possibilities.

Ed:

Well, Bill, I gotta go. Thanks a lot for your time and wish me luck, will you? I'm going in to present this to the boss and try and sell him on the idea of letting us try the system here. And say, Bill, if you ever get down to Mississippi, or Longview, Texas, and have a few hours to spare, don't miss a chance to see the LeTourneau Plants. They are a great bunch of fellows.

Bill:

O.K. and thanks a lot, Ed. Be seeing you — and I'll keep my fingers crossed.

Vacuum System Helps Dust Collectors

(Continued from page 57)

fitted with plug-in terminals at various locations, so that the flexible hoses and brushes used in the clean-up can be kept to a convenient length. To clean up a particular machine or area, the worker plugs his hose into the nearest outlet, vacuums that location, disconnects the hose and moves on to the next area. Hinged caps cover the outlet when the terminal is not in use.

That Bond takes its plant clean-up seriously is pointed up by the fact that plant operations are not started on Monday until the processing area has been completely cleaned. Monday morning is chosen as clean-up time because the dust has a chance to settle over the weekend. Routine minor clean-ups are made daily.

While the Exidust system is not an integral part of the production process, it makes some rather important contributions to plant operations. First, of course, is the elimination of a potentially serious fire and explosion hazard. Second, is the improvement of health and working conditions by holding down the concentration of fine cork dust in the air. Third, is a substantial reduction in insurance rates because of the reduced fire and health hazards.

Silicones Aid Texas Plant

APPLYING ALUMINUM PIGMENTS IN HIGH-HEAT PAINTING USE

OUTSTANDING success in the use of aluminum pigment for a high-heat painting application is reported by the San Patricio reduction plant of Reynolds Metals Company, located near Corpus Christi, Texas.

R. C. Dill, plant engineer of the Reynolds Corpus Christi aluminum making facility, said: "This painting job has created considerable interest in this area, especially among operators of diesel engines, and we have had numerous visitors to see this job. It is, I believe, rather remarkable, especially in view of the fact that many of the oil companies in this area consider a 90-day life on a similar paint job to be excellent."

Diesel exhaust stacks at Reynolds Metals Company's San Patricio plant, near Corpus Christi, look almost as good as day aluminum pigment was applied by new method, 2½ years ago.

After receiving the above service report from Reynolds Metals Company the editors of Southern Power and Industry asked for details which we are sure our readers will want. The following report was furnished by Mr. John W. Nee, Vice President of Briner Paint Manufacturing Co., Corpus Christi, Texas.

THROUGH the cooperation of Mr. R. C. Dill, Plant Engineer at Reynolds' San Patricio Plant, we were invited to try and work out a satisfactory coating system for the mufflers and stacks on the Cooper Bessemer and General Motors Engines in this plant.

Studies started in February, 1952, when three stacks were painted by three different procedures, and observed for five months. At the end of that time, one stack was so far superior to the others, that the procedure used on it was chosen. The other two experimental stacks were then blasted clean and finished in accord with the selected procedure.

The Reynolds plant has 83 mufflers and stacks: 42 Cooper Bessemer, and 41 General Motors. The system selected was as follows:

1 coat—Briner's Silicone Primer #2905

1 coat—Briner's Silicone Aluminum #2910

The contract was given to the Industrial Painters and Sandblasters Inc., of Corpus Christi and Texas City, Texas, and was done as follows:

Cooper Bessemer Stacks

Sandblast to white metal (very clean) and apply one coat Silicone Primer #2905 to cold stack. Run engine until temperature rises above 400 F and allow primer to cure. Shut off engine and cool.

Apply one coat of Silicone Aluminum #2910 and repeat upheat on engine, and put engine back on line.

On the General Motors engines, it was thought that the air intake device on engines adjacent to the stack being blasted might suck in the sand, so sandblasting was not permitted and the stacks were ground down with power sanders as clean as possible and the finish applied in the same way as on the Cooper-Bessemer units. Of course, it was difficult to clean around bolts and flanges with power sanders, and so it was not possible to obtain as good a surface preparation as was obtained by blasting.

The effect of proper surface preparation is very easily seen from the results obtained on these stacks. The actual coating of stacks was done between February and October, 1952, and the Cooper Bessemer engine stacks that were sandblasted are in excellent condition after 24-30 months (depending on when they were painted). But the stacks serving the General Motors engines (power cleaned) started to show minor failure around bolts and flanges in 17-18 months.

We are convinced that much of the success of this product was due to the care taken by the applicator, who did a magnificent job of surface preparation, and was very conscientious about the application.

Another important element in our success was the development and use of the special Silicone Primer #2905. Value of the primer was proven by running one stack with no primer, using two coats of Silicone Aluminum #2910, and comparing it with stacks painted by the accepted procedure. Results are approximately 40% better on the primed stacks at this date.

The Silicone finish system was developed from a long series of tests, checking on all the literature on the subject, trying each in laboratory tests, and by process of elimination. Finally we arrived at a base formula, which with a few adjustments, proved excellent in repeated laboratory tests, and these were substantiated in field tests.

The location of the stacks at the Reynolds Metals Plant are about 1000 ft from open sea water in Corpus Christi Bay, with the prevailing wind blowing off the bay. These engines operate intermittently, and may be up or down at any time. So far we have not had any failure due to alternate heating and cooling.

Steam and power from back pressure unit . .

EXPANSION OF POWERHOUSE FACILITIES

Mobile, Alabama, Works of Aluminum Company of America

Process steam requirement controls electricity generation as turbine reduces pressure from 850 to 110 pounds

THE facilities of the Mobile, Ala., alumina works of Aluminum Company of America were recently expanded one-third. Included in this $12 million expansion, which made Mobile works the largest alumina plant in the country, was an enlargement of the powerhouse and its auxiliary facilities.

Alumina refining, a chemical process utilizing both heat and pressure, requires substantial quantities of steam. Power needed at alumina plants is generated as a by-duct of steam production. The powerhouse portion of the Mobile works expansion involved the addition of a boiler, generator, feed pump and compressor, along with the installation of auxiliary electrical equipment.

The New Boiler

The new boiler, which is capable of delivering 175,000 pounds per hour of 850F, 850 psig steam, was added to supply increased steam requirements. This was in addition to three existing 125,000 pounds per hour 850F, 850 psig boilers. Steam at this pressure and temperature is used to operate three turbine generators and three turbine-driven boiler feed pumps, and also for electric power generation.

The process at Mobile requires 110 psig steam. Drives on the boiler feed pump and turbine generator exhaust at this pressure to supply process steam as required. Additional 110 psig steam, if needed, is supplied through a pressure-reducing and de-superheating station. The 110 psig

NEW TURBINE GENERATOR—Mobile, Alabama, Alumina Works of Alcoa.

— Principal Equipment —

Boiler	Babcock and Wilcox Company
Forced and Induced Draft Fans	American Blower Corporation
Boiler Feed Pump	Ingersoll-Rand Company
Boiler Feed Pump Turbine	Terry Steam Turbine Company
Turbine Generator	General Electric Company
Switchgear	General Electric Company
Air Compressor	Ingersoll-Rand Company
Turbine Oil Conditioning System	S. F. Bowser Company
Condensate Booster Pump	Ingersoll-Rand Company
Deaerating Heater	Elliott Company
Pump Controls & Feedwater Regulators	Republic Flow Meter Company
Miscellaneous Flow Meters	Republic Flow Meter Company
Desuperheaters	Republic Flow Meter Company
Boiler Controls & Meters	Bailey Meter Company
Cooling Tower	J. F. Pritchard Company
Fuel Oil Heaters	The Engineer Company
Generator Fire Protection System	Walter Kidde & Company

steam supplies process heating for digesters in the alumina production process, and operates the steam-driven air compressors and condensate pumps. The temperature of the 110 psig exhaust is controlled by de-superheaters.

The new boiler can be fired either with natural gas or oil, and is capable of maintaining a capacity of 20,000 lb of steam per hour for four hours. It is equipped with a superheater attemporator, electric arc lighters, and automatic safety features. Despite variations in steam demands, an 850 psig steam header, which is common to all four boilers, is maintained at constant pressure by automatic controllers.

New Turbine Generator

The new turbine generator, along with associated 4160-volt switchgear, was added to help supply the increased electric power load. This new generator is rated at 7500 kw, 4160 volts, as are the two turbine generators originally installed. A new, 4160-volt power feeder was installed from the powerhouse to distribution stations in the plant yard. The feeder is bare, all-aluminum cable. Practically all wiring in the powerhouse expansion, as well as the general plant expansion, was done with aluminum conductors.

Load Control

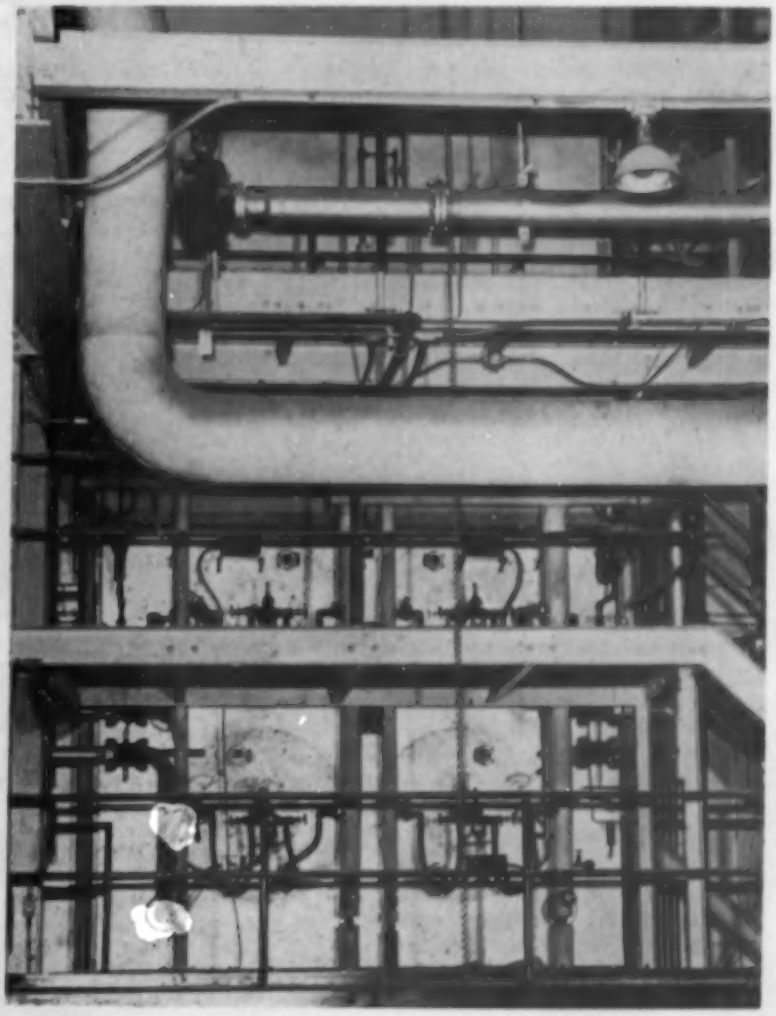
The amount of electric power generated at Mobile is normally controlled by requirements for 110 psig steam in the plant process, since the turbine generators act as pressure-reducing stations to supply the 110 psig steam.

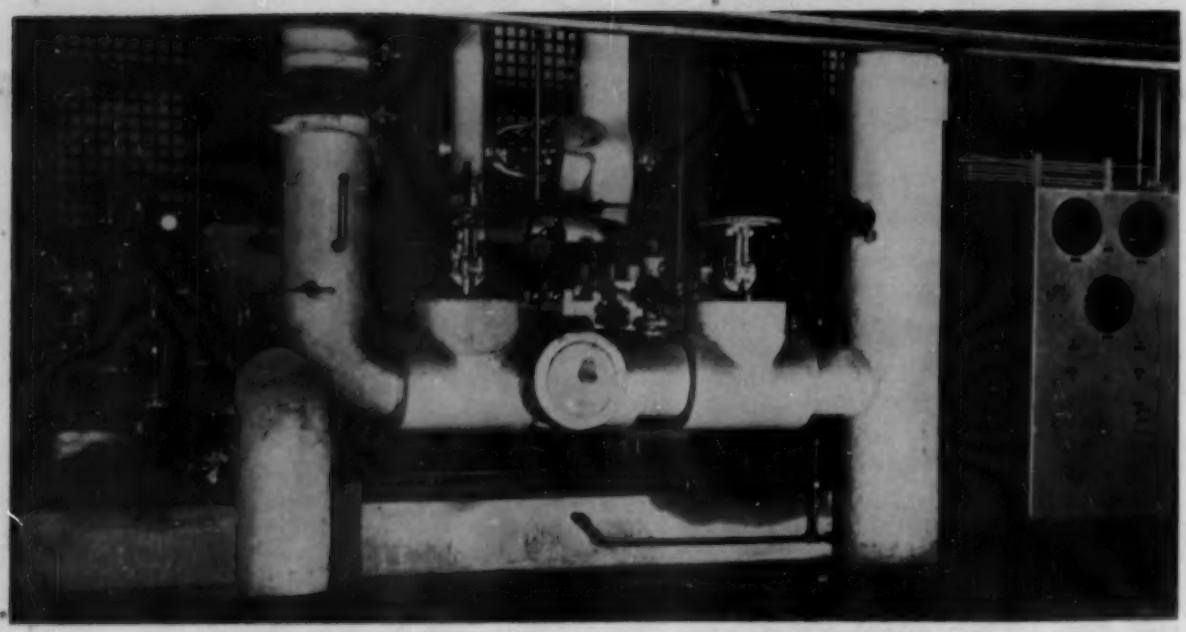
The steam is maintained at constant pressure by a back-pressure governor on the turbine generator. There is a fairly close balance between the electric power and steam requirements, although there is usually some excess power generated. This excess electric power is transferred to the local power company through an interconnection that also serves as an emergency power supply.

Boiler Feed Pump

The new boiler feed pump was installed to supply the increased requirements for boiler feedwater. It is turbine-driven, rated at 600 hp, and similar to two feed pumps that were originally installed at Mobile. The water to the boiler feed pumps is supplied from a new deaerating feedwater heater,

FRONT OF NEW BOILER, SHOWING FOUR BURNERS.





NEW BOILER FEED PUMP. Front of boiler safety interlock panel is at right.

with a 500,000 pounds per hour capacity, that was added during the powerhouse expansion. The heater operates at 110 psig pressure.

All the feedwater for the boilers is obtained as condensate from process liquor heaters in the alumina works. This condensate is returned to a boiler feed tank at the powerhouse from the heaters in the plant. The condensate is pumped from the boiler feed tank to the deaerating heater, and from there it flows to the boiler feed pumps.

Air Compressors

The new steam-driven air compressor, with a capacity of 6000 cfm, was added to meet the increased demand for 110 psig air for use in the plant process. There are now three steam-driven 6000 cfm air compressors, and one electric motor-driven 2000 cfm air compressor, supplying the total air requirements.

Engineering

All the engineering for the powerhouse expansion, as well as the general plant expansion, was done by the engineering division of Aluminum Company of America. National Valve and Mfg. Company performed the pipe work, and Gulf Electric Company of Mobile, Ala., the electric wiring for the powerhouse expansion. W. Horace Williams Company of New Orleans, La., was the general contractor for the main plant expansion.

Stock Racks Constructed in Record Time

DURING a four-week period at MARTIN AIRCRAFT plant in BALTIMORE, MARYLAND, twenty-five two-level (mezzanine type) bar stock racks that were engineered and fabricated to customers' specifications at the factory, were completely assembled, installed and loaded. The new type framing material used in this fast job was "Mult-A-Frame," manufactured by Mult-A-Frame Division, Ainsworth Manufacturing Corporation.

Each of the twenty-five units is 10 ft wide, 12 ft 6 in. high and 20 ft deep and contains 80 compartments, each compartment designed for a 4,000 lb load. One complete section will support 160 tons of steel and features a 5 ft catwalk in front of the upper section to facilitate loading and unloading from the upper tier.

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Unit loads and palletization . .

BIG VOLUME—FEW TRUCKS

Efficient System at Emerson-Electric in St. Louis

INTELLIGENT organization of the materials handling function around a materials handling manager permits fast and efficient material movement by a relatively small number of battery powered rider-type and non-rider trucks at The Emerson-Electric Manufacturing Company in St. Louis. One of the country's largest manufacturers of electric fans, they also produce electric heaters, power saws, and arc welders. This company has been a manufacturer of power motors, 5 hp and smaller, since 1890.

Personnel—Equipment

The Manager of Material Handling reports directly to the Manager of Production Control. Under the Material Handling Manager are five foremen; materials movement, stores, collections, shipping and the night shift foreman.

The material movement foreman is perhaps the key figure under the Manager of Material Handling, because he controls the long-distance movement of material by the nine rider-type battery powered trucks (4000 lb capacity) and three gas trucks (2500, 4000 and 8000 lb capacity). Acting under his direction are the truck dispatcher, 15 rider-type truck drivers and 10 non-rider truck operators in addition to the elevator operator.

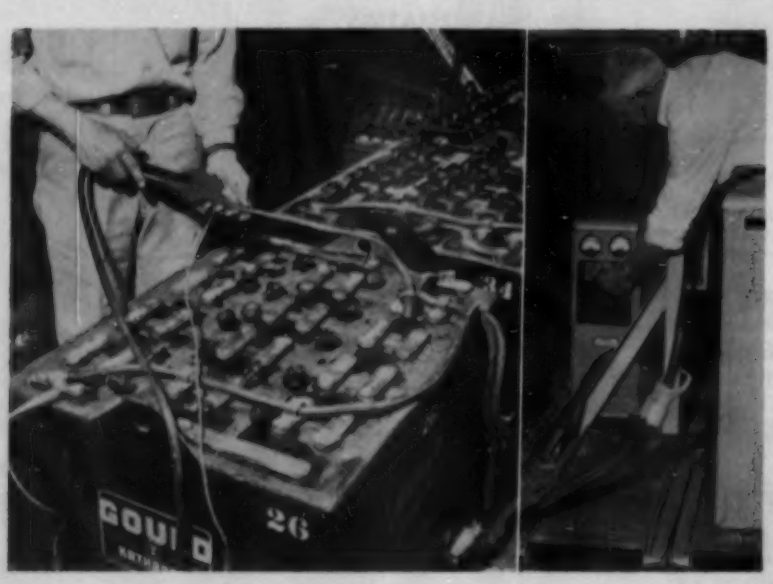
A truck dispatcher controls the rider-type trucks from a central office by means of a two-way loudspeaker system with six stations throughout the plant. The operators report to the nearest station for orders after delivering a load and at least once every 20 minutes if engaged in a long, repetitive hauling job. Requests to move material are made by telephone to the truck dispatcher who in turn selects the nearest truck to make the move. Each individual move by the rider-type trucks is logged-

TRUCK OPERATOR reports to central dispatcher over one of six two-way loud speakers that the previous move has been completed and receives instructions for the next move.

in by the truck dispatcher who gives the time the request was received and the time that the driver reports the move completed.

Certain ones of the six battery-powered non-rider trucks and three non-rider stackers come under the direction of the stores foremen who are responsible for movement in and out of the general store-rooms and for handling raw materials. Others are assigned to production foremen who use them for transporting pallet loads of material through their sections and finally to the outgoing area for transfer to subsequent stations.

A wide variety of special con-



WATER from the still is added to batteries through the interesting device shown at the left. Hose from suspended bottle is connected to copper tube. End of copper tube has ring which permits entry of spout a calculated distance into cell, corresponding exactly with correct electrolyte level. Water flow is controlled by valve by operator. When electrolyte in cell reaches correct level, an electrical contact is made which causes small red light on the tubing to light, indicating to the operator that enough water has been added.

POWERIZED hand truck batteries are charged at nine of these decentralized stations through rectifiers. Note rollers which make it easy to roll batteries in and out of the non-rider type trucks.

Corrugator in paper board mill

Flatwork ironer in laundry

Felt dryers in textile plant

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Steam costs DOWN 40%

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MANY items are delivered to Emerson-Electric in unit loads on pallets as part of the purchase contract such as these small spools of copper wire. They are kept on pallets secured by steel strapping until they are delivered to the production machines.

tainers, skids, boxes, shelf-trucks, gear boards, etc., are also a part of the equipment of the material handling department. Some of these items such as shelf-trucks are moved by hand from production areas to material movement areas but are designed so that the entire shelf-truck with its load can be picked up and transported by the powered fork-lift trucks. All of the rider-type trucks are equipped with towing eyes and can pull trailer-trains.

Another piece of specialized material handling battery-powered equipment is the crane truck which comes under the jurisdiction of the maintenance department. Equipped with a low-lift platform as well as a short boom with a capacity of 3000 lb, this unit is constantly on the move inside and outside the plant picking up, transporting and placing dies, structural steel, small machine tools, etc. It is permanently manned by an operator and a helper. Slings and other rigging tools are carried on the truck at all times. The boom is especially useful in picking up or placing objects in spots which are not readily accessible.

Battery Charging

Emerson-Electric has standardized on 15-cell, 21-plate, 550 ampere-hour Gould batteries for all its rider-type trucks including the crane truck. There are two of these storage batteries for each rider-type truck.

All charging of the large batteries is accomplished in a central station under the direction of the electrical maintenance foreman. The materials movement foreman has no control over battery charging and maintenance except that he holds the electrical foreman responsible for providing his trucks with properly charged batteries.

The main charging station is equipped with two motor-generator sets which furnish power for battery charging through 11 panels. The modified constant voltage method of charging is used with a taper charge which is switched on automatically. The batteries are charged at the full line voltage up to 80% capacity in four hours and four hours at the finish rate.

Every battery is given an equalizing charge at least every two weeks. It is the opinion of Emerson-Electric maintenance officials that the equalizing charge together with all around good maintenance is largely responsible for the fact that eight of their industrial truck batteries are giving good service after five to six years of use and eleven have been operating for four years.

Battery Handling and Care

Batteries are lifted from the trucks by a hoist mounted on a fixed monorail and are placed in special four-wheeled dollies. They are then rolled by hand a few feet to bring them within reach of the charging cables. Fully charged batteries are rolled from the charging panels to a position near the truck and hoisted in.

Distilled water from a small still operating near the main battery station is used to replace evaporation losses. The five gallon glass bottle is hoisted to a position high enough to provide a siphon effect through a rubber hose. The water is actually added through a copper tubing. The end of the copper tubing is inserted into each cell until it is stopped by a ring around the end of the copper tubing. The projecting of the spout into the cell corresponds exactly with the proper electrolyte level. When the water reaches the correct level and makes contact with the end of the copper tubing, an electrical circuit is closed and a small red light mounted on the copper tubing is illuminated indicating that sufficient water has been added to that particular cell.

De-Centralized Charging

The nine non-rider type trucks have their batteries recharged at nine separate stations located conveniently throughout the plant through rectifier charging equipment. Each of the de-centralized stations is equipped with two sections of roller conveyor located at a convenient height from the floor for ease in handling.

A complete set of safety rules applicable to the operation of industrial trucks is posted for the guidance of the truck operators.

A warning bell device was recently developed and installed on all of their battery-powered trucks to warn employees that an industrial truck is approaching. Mounted on a wheel of each truck is a bell housing inside of which is fixed a tube with a steel ball free to roll in it. As the truck travels, the steel ball rolls back and forth in the tube striking the bell housing each time.

Pallet Program

As a general rule, suppliers are required to furnish material to Emerson-Electric in unit loads, as part of the purchase contract. For instance, certain types of small castings are delivered in wire pallet containers. These are the property of the supplier and Emerson-Electric returns them after use. In the case of tops for saw tables, Emerson-Electric sends pallets to their suppliers. Small spools of copper wire are supplied to Emerson-Electric on pallets in strapped unit loads. The spools are handled as unit loads from receiving, in storage and right up to the production processing machines when strapping is cut.

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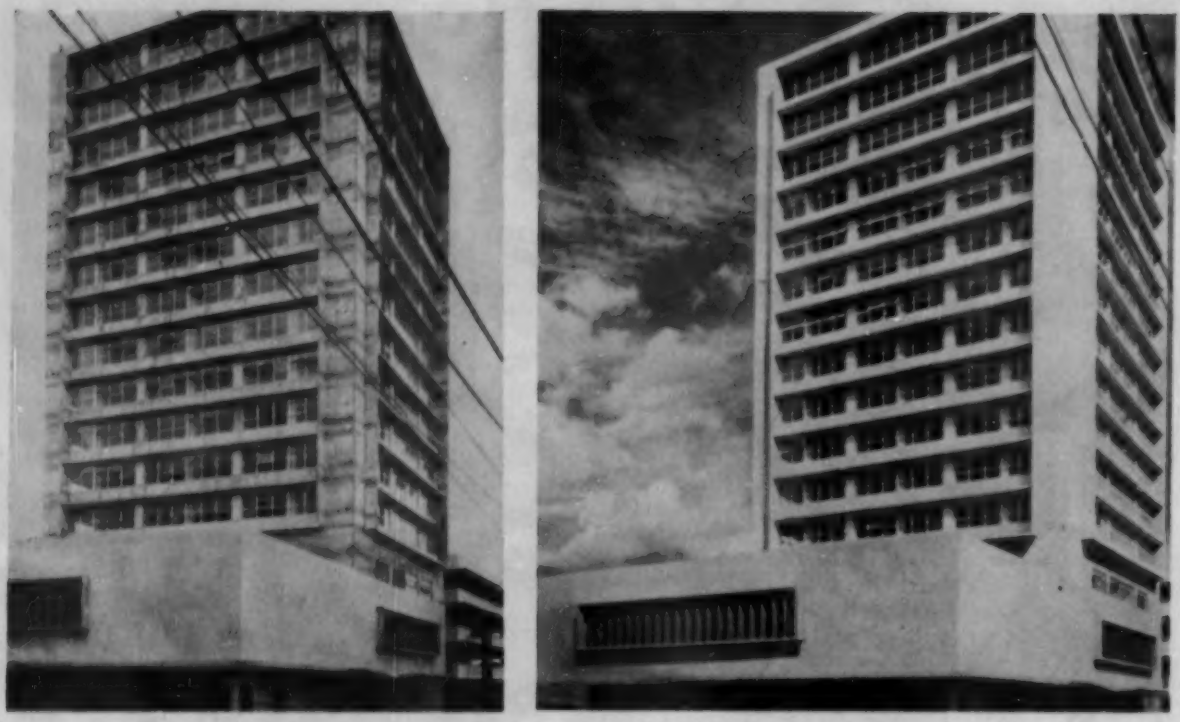


Before and after views showing bare concrete at left and the plastic coated structure at right.

New Building Technique

Tyler, Texas, Hotel Gets Plastic Coat

Longer Life, Lower Cost, Better Appearance Claimed

THE NEW 15-story Carlton Hotel in Tyler, Texas, stands bright and shining with a smooth, jointless veneer of Plastispray, a vinyl plastic covering that looks like the wall of a modern living room and for which its manufacturers claim the most complete weatherproofing properties ever put into use in the construction field. "It is impervious to the effects of mildew, mold, acids, petroleum solvents and alkalis."

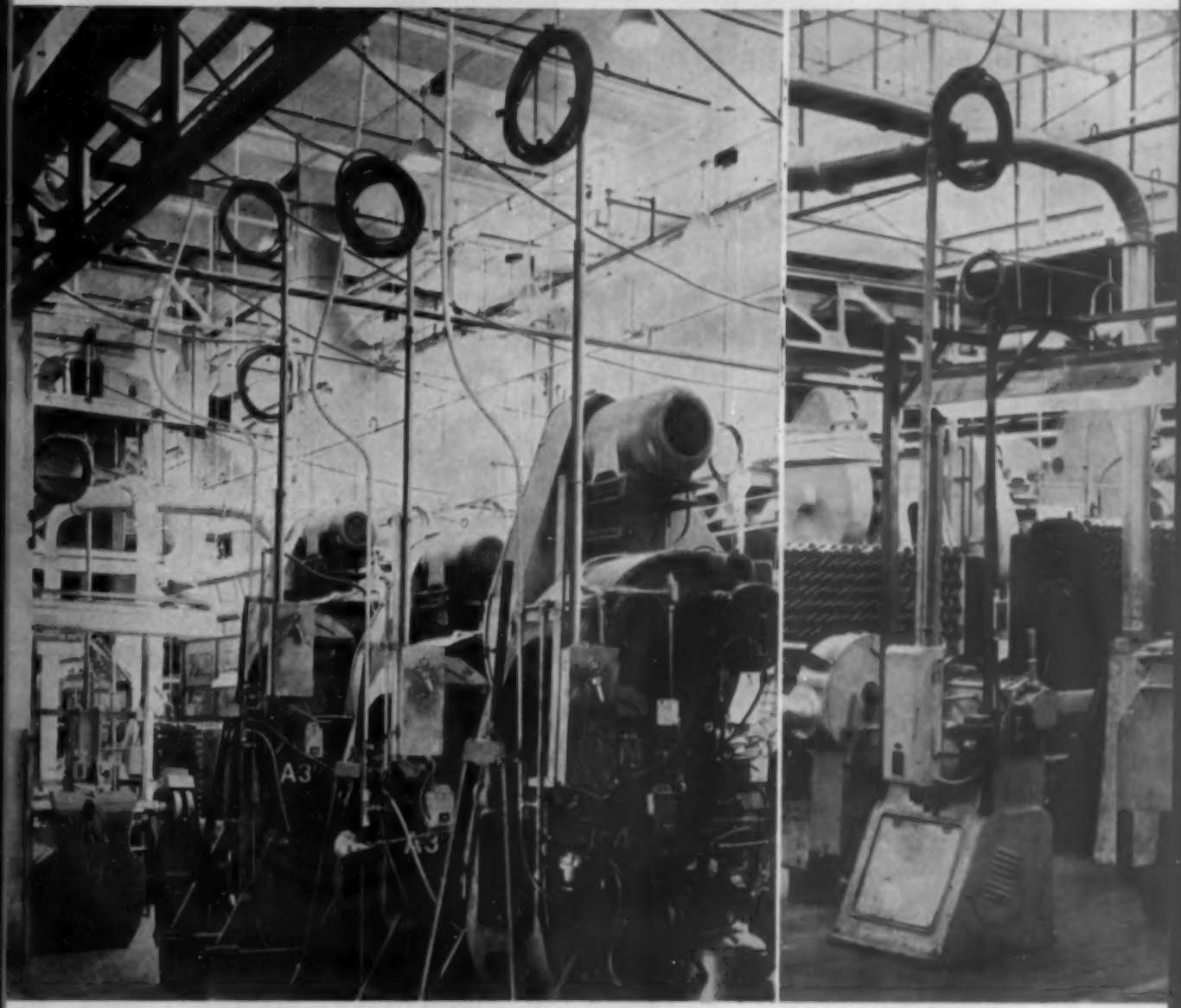
According to Mr. Justin Lubold, president of Liquid Plastics Corporation, merchandisers of Plastispray, the use of this revolutionary technique made very substantial savings possible. The flexible, weatherproof, non-combustible skin, .030 to .035 in. thick, was sprayed directly on the concrete to form a continuous, jointless sheeting of 40,000 sq ft of area, eliminating all flashings, coping, facia and painting ordinarily used on such a structure.

The work was performed in six weeks' time by two licensed applicators of Liquid Plastics Corporation, Progressive Industries, Inc. of New York and Lawrence Service, Inc. of Houston, Texas., using 4 sprayers and 3 helpers. They applied 1400 gal of Plastispray at a cost of $16,000, enclosing the top 14 floors at an average cost of 40¢ per sq ft. The sprayers worked from the ledges using spiders only for the corner parts of the building.

This revolutionary construction method was first proposed by Designer Guy G. Rothenstein, formerly with Skidmore, Owings and Merrill, and now Architectural Consultant to Liquid Plastics Corp., and is an outgrowth of the war-time method of mothballing ships and machinery for storage by spray-packaging.

Plastispray, the architectural counterpart of these packaging plastics, may be considered as a permanent material with 3 to 4 maintenance treatments required during the normal life span of a building. This maintenance consists of injecting plasticiser into the sheeting by covering it with a new top layer. Otherwise the only maintenance required consists of simply washing the surface.

MODERN WIRING PAYS FOR ITSELF



Coils of Anaconda Powerduct cable (near ceiling) provide reserve footage for simple relocation of machines. This system greatly increases advantage of busduct, saving time and cost of moving rigid conduit.

Double the flexibility of your busduct with "plug-in" Powerduct Cable

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POWER CABLES

The Dimensions of an Efficient Plant Manager

Part 3
SUPERVISION

There are three main divisions of plant management. Mr. Pounds discussed OPERATION in our January issue, and MAINTENANCE in February. This article on SUPERVISION concludes the series.

By TRUMAN E. POUNDS
Superintendent No. 2 Power Plant
The Dow Chemical Company
Freeport, Texas

SADLY enough, the day when it was the general practice of an operator to thoroughly train himself by accelerating his own on-the-job practical experience and studying the theory of operations at a trade school or at home by correspondence, are as old fashioned as "working for a living." It used to be that before an operator could even expect a promotion he had to know thoroughly all the details of the next job above his. Since, in many cases, collective bargaining has long since changed this type of accomplishment, industrial training at company expense has now become a must if the plant manager is to be assured that his operators are more than just barely satisfactory.

Training Methods

How can training be done most effectively and with the least amount of money? Surely it is not industry's goal to educate just to increase the social and scientific knowledge of its employees. Individual industrial training ceases to be economical after the operator on a new job is, in the manager's mind, capable of efficiently handling his operations under most ordinary and emergency conditions. Not all personnel will be capable of acquiring enough knowledge to obtain the minimum required proficiency, and some others will fall far below standard because of just plain laziness. But where the applicants have reasonable ability and desire to learn, industrial training programs can be accomplished more or less effectively in three different ways.

The first and least costly way, but one which falls far short of producing satisfactory results, is to allow the new operator to be trained by an old operator and then expect the new man to supplement his sketchily acquired information by reading written operating instructions, tracing lines, and asking questions.

The second way, which in contrast to the above method costs the most, is to utilize formal classroom instruction for imparting the necessary operating procedures and theory to the plant's personnel. Some organizations have gone so far along this line that the cost of their school is greatly affecting the cost of their product.

The third procedure, which seems to be most effective yet is not overly expensive, is to have one supervisor in the organization, preferably a foreman, with the responsibility of individually working with an operator needing instructions. In a sense, you might call this man a trouble shooter in that actually he will be correcting operational troubles when the source of erroneous operations stems from the lack of knowledge on the part of the operator. If the lack of knowledge is due to laziness, the trouble shooting instructor will uncover the cause, because it is extremely hard to deceive such a practical authority.

Basically, the individual instruction program functions as a division of responsibility since both the operator and the company must do their own part under such a training system. Normally the instructor foreman begins his responsibility by interviewing prospective employees along with the plant manager. After all concerned agree on the man to be hired, the new employee literally spends his first day on the

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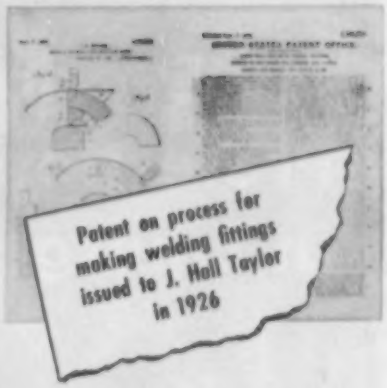

Patent on process for making welding fittings issued to J. Hall Taylor in 1926

The formula was written in 1926—

The invention of oxyacetylene and electric arc welding touched off the greatest single advance in modern piping practice—pipe welding.

The old way—the screwed fittings and heavy flanged fittings—put up a brave fight, but the handwriting was on the wall! For all important piping the old method was through.

Proof that Taylor Forge had foreseen this clear back in 1926 is shown above. Significantly enough, the process covered by this patent is still employed to give WeldELLS certain advantages not found in any other welding fittings.

But Taylor Forge experience had suggested careful procedure — had foreseen that pipe welding could not advance beyond its crude, torch-happy stage until *all* necessary fittings were provided to make *complete* welded systems.

It took a number of years to do this job with Taylor Forge thoroughness, but in 1931 the announcement was made of the first complete line of seamless butt welding fittings — the first line to include not only elbows and return bends, but also full branch and reducing tees, concentric and eccentric reducers, stub ends, caps, and the all-important (and then revolutionary) welding neck flanges.

Out of 31 years of designed piping experience had come the greatest contribution to piping permanence.

An episode in the story of Taylor Forge leadership in designed piping

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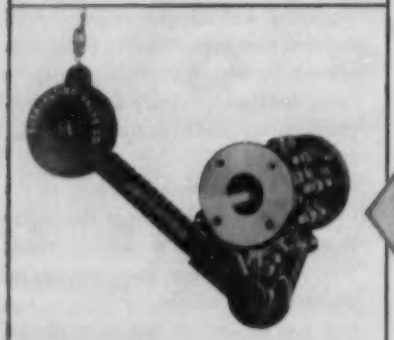
to divert water to sprinkler deluge or water curtain systems, or to divert inflammable liquids to a point of safety.



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CLOSING TYPE

to shut off the flow of inflammable liquids or to concentrate water or steam in fire mains.

Both types can be controlled thermostatically, electrically, or manually from any or many locations. Their design assures positive, dependable protection because they do not wedge and consequently cannot stick.

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job in company with the foreman instructor. This time is spent in getting acquainted with the plant and personnel, rules and regulations, and the broad scope of his first operational job.

Toward the end of his first day or during the morning of the second day, details of the job are then outlined by the foreman. The new man is next teamed up with an older operator for a three or four day on-the-job training program during which time he is also expected to read the book of operating instructions.

After the completion of the first five days of this type of training, the new operator is then verbally quizzed by the foreman instructor. If the probationary employee passes the quiz to the satisfaction of the foreman, he is then put on his own shift. Actually, there have been very few cases in our records where an operator failed to acquire the necessary proficiency.

Advancements

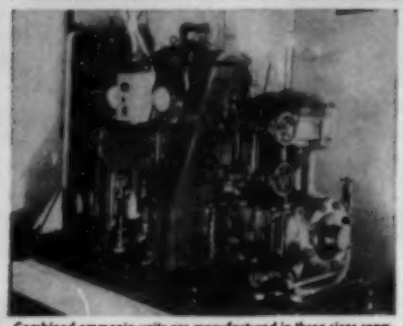
Later advancements up the line of progression are handled in a similar manner except that the training period for the more difficult and responsible jobs generally requires from two weeks to a month before the operator being promoted will be turned loose on his own. Such an extended period of training may seem excessively long; however, when weighed against the millions of dollars worth of equipment which can be damaged, this indoctrination period is no more than a minimum.

Except for greatly deficient operators, general shift-wide training is carried on by the instructor foreman as a normal routine. Monday may find him working with a day shift fireman, showing him how to best control combustion, or how to visually inspect conditions of the furnace. Tuesday may be spent quizzing the electrical distribution switchboard operators on the possible operational emergencies and their correction; while on Wednesday he may be working with the water treating plant operators or imparting safety precaution instructions to va-

Frick "ECLIPSE" Type PF compressors, built in six sizes up to 150 H.P. and having 2, 3, 4, 6 or 9 cylinders, may be used with any refrigerant at any temperature. They are ideal for such work as air conditioning, marine service, watercooling, food storage and processing.

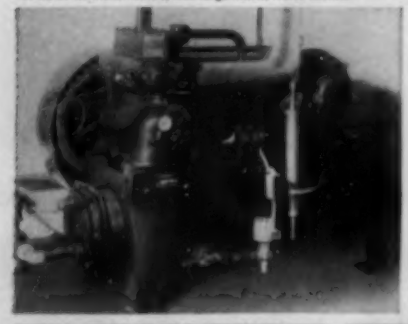
"ECLIPSE" Type AHP compressors are available for regular ammonia service under high operating pressures. These heavy-duty machines are built in three sizes with 3, 6, or 9 cylinders of 2½" bore and 4¼" stroke.

"ECLIPSE" Type PAB booster compressors, built in six sizes, are noted for their dependability and efficiency. Small frosted lines cool the cylinder valve plates with direct-expansion refrigerant—a patented Frick feature.



Combined ammonia units are manufactured in three sizes ranging from 2½ to 10 tons of refrigeration. They are a popular choice for food service, cooling drinking water, making ice, dairy plants, etc.

Frick low pressure units are built in 36 sizes from ½ to 15 hp. Condensers on smallest machines are air cooled; on intermediate sizes, air or water cooled; and larger sizes, water cooled.



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When you specify Frick machines you have the widest choice of models, and are sure of getting a compressor exactly suited to your needs.

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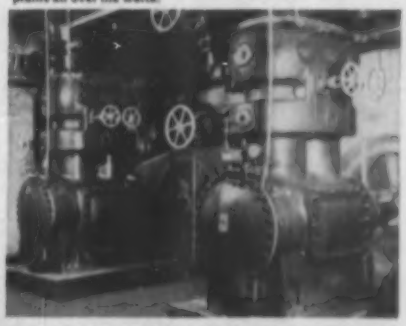
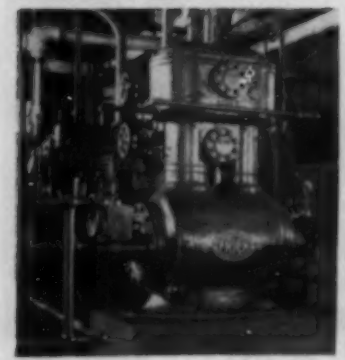
FRICK CO.

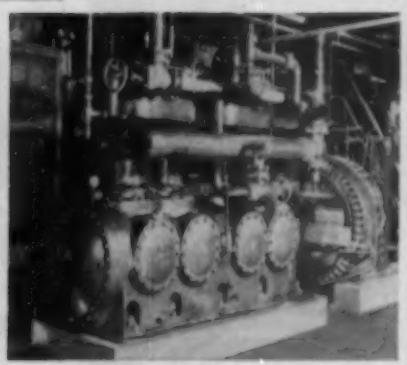
"ECLIPSE" Type PF low pressure units are furnished in 15, 20, 30, 40 and 60-hp. sizes. Shell-and-tube coolers may be added to form compact water chilling units.

Frick Company pioneered the development of the booster compressor. Since 1929 these Type PB machines, built in seven sizes, have been regularly installed by ice cream and quick freezing plants all over the world.

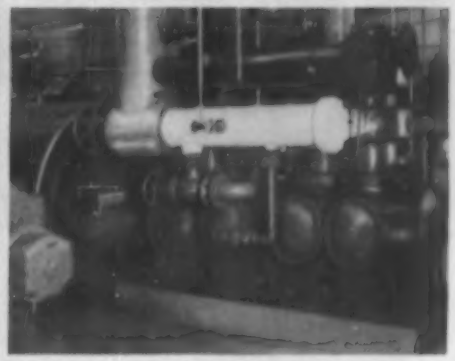




Frick two-cylinder enclosed Type V.S.A. ammonia compressors have been perfected over the past 40 years, until today they are the standard of the industry. They are available in capacities from 2 to 300 tons, in 11 sizes.

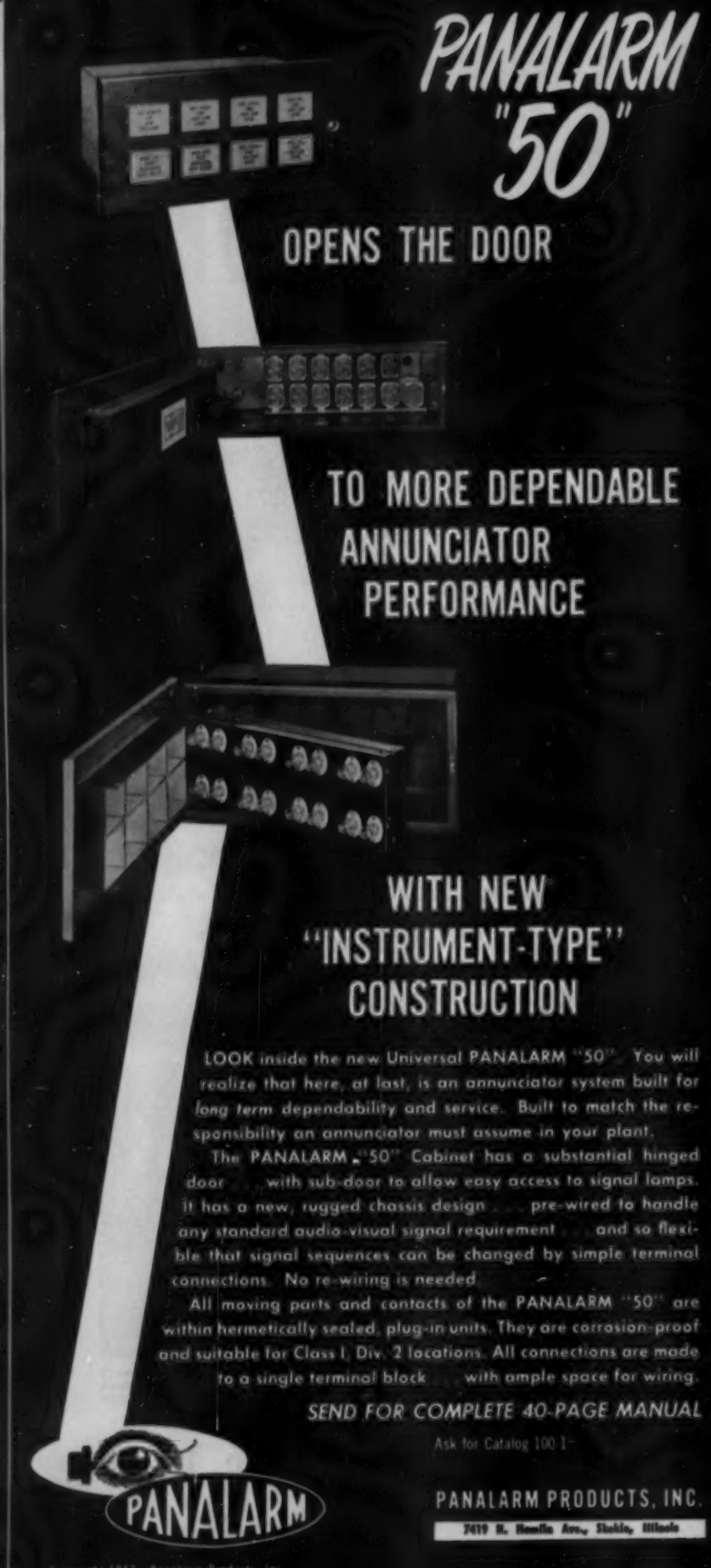


Four-cylinder Type V.S.A. enclosed compressors are normally offered in four sizes with capacities up to 900 tons. Furnished with capacity controls on each cylinder, these machines give the user maximum flexibility and durability on heavy-duty refrigerating service, such as in the food and chemical industries.



Frick four-cylinder Type PB enclosed V.S.A. ammonia booster and Freon-12 compressors are available in 15" by 10" and 17½" by 12" sizes. Seabrook Farms, the world's largest quick-freezing plant, has eight of the larger size.

Frick Dependable Refrigeration Since 1882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WITH NEW
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CONSTRUCTION
LOOK inside the new Universal PANALARM "50". You will realize that here, at last, is an annunciator system built for long term dependability and service. Built to match the responsibility an annunciator must assume in your plant.
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rious other personnel.

Like the emotion of an evangelistic preacher, a good instructor's enthusiasm is so catching that soon all operational personnel are quizzing each other on routines and emergencies. When this occurs, the plant manager can rest assured that operational faults causing avoidable shutdown will decrease to a minimum.

Operating Instructions

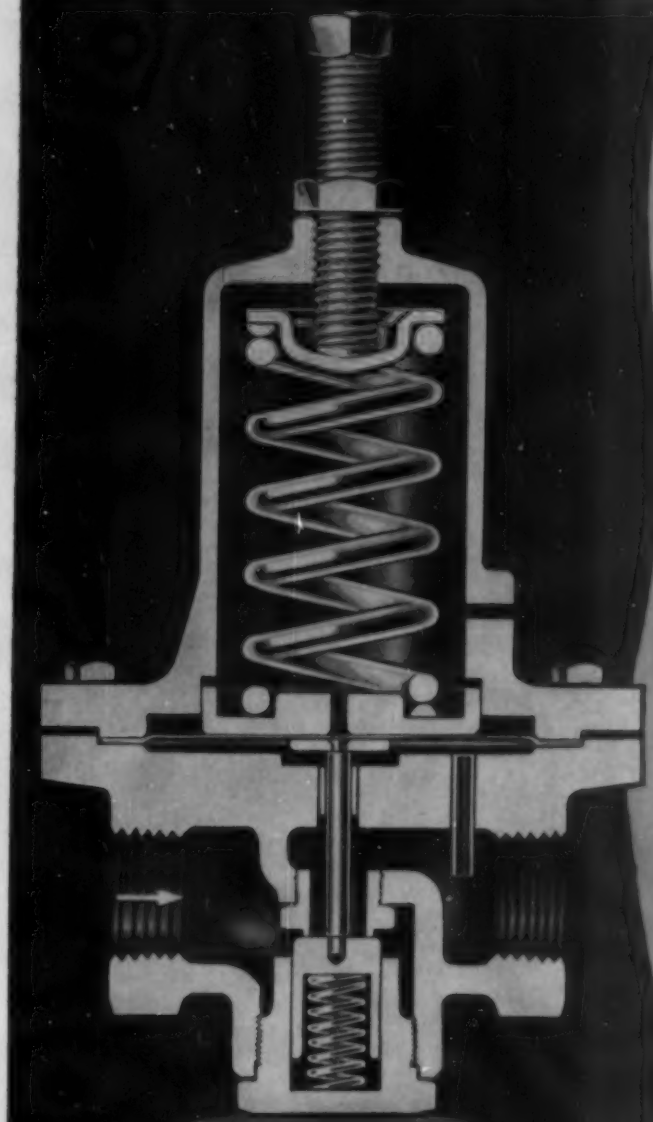
Grave injustice would certainly be done to this topic if it were not pointed out that an up-to-date set of operating instructions is also needed to supplement the above training procedures, to use as a check off list in starting up or shutting down various pieces of equipment, to eliminate the possibility of the uninterested operator's claim of, "He never told me that," and to establish plant policies supplemental to those of the company. These instructions should also contain all the answers to advancement questions which should be required for all operators being promoted.

As a final thought on this subject, formal classroom type of instruction does have its place in training an assortment of operators, of various amounts of experience, when it is necessary to develop an organization for an entirely new plant. As a means of instruction for old and established crews, our experience with the classroom has been very discouraging. The arms of Morpheus have been very inviting to operators being trained on time-and-one-half pay.

Work Incentives

After a wage, sufficiently rewarding for the operational job being performed, is agreed upon by collective bargaining and after working conditions and employee benefits are agreeably settled to the satisfaction of all concerned, what motivating force then instills in an operator the desire to excel?

Certainly it is not the fear of the boss since under our present labor contract system of establishing agreed-upon working rules



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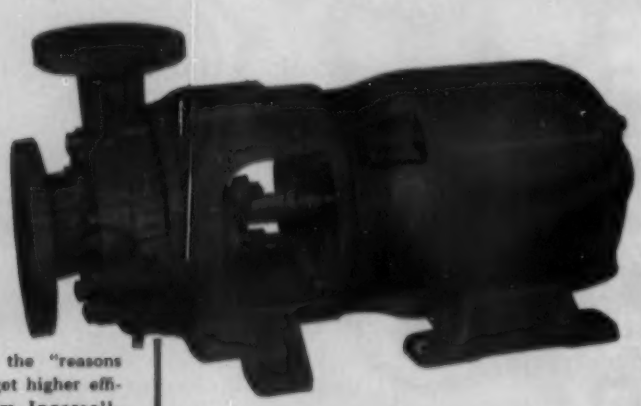

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and regulations, an employee doing only a little more than a satisfactory job can expect to remain employed and progress according to seniority as long as he continues to perform in an average manner, even though the plant manager may not like him personally. If it were not for incentives in our industrial and social system of today the store of information in text books and papers outlining the principles of leadership would constitute a folly of misadvertised ideals.

Actually, as all plant managers are aware, there still exists an adequate set of rules agreed upon by both the company and the union which can be legally used to require satisfactory operator performance should some employee feel the desire to be uncooperative. What then is this hidden incentive force that is so tangible and yet so real which converts the menial task of breaking rocks into the art of building a cathedral?

Basically, the human being needs the satisfying experience of knowing that his job is an important cog in the wheel of industry, and that those over him recognize his accomplishments and the importance of his functions. An early morning statement of how well he is doing his job, concern over his sick baby, or encouragement in respect to a correspondence course which he is taking will go a long way toward building individual operator and plant-wide morale. Of course a pat on the back and verbal praise leads to noteworthy accomplishments only if the compliments are sincerely earned and given.

To be sure, it may also be necessary to jack-up an operator occasionally if circumstances warrant such action, but never as an outburst of emotions. Discipline is never necessary just to show the people who is boss.

The results of such a display of authority, more often than not, leave powerful resentment in the heart of the operator receiving the reprimand and shame on the conscience of the supervisor. There are, however as everyone knows, exceptions to all rules. But

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If you're planning to modernize your plant or build a new one—or if you are just interested in cutting fuel costs—find out how coal, burned the modern way, compares to other fuels. Talk to a consulting engineer or your nearest coal distributor. Their advice may save you thousands of dollars every year.

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Between America's vast coal reserves and mechanized coal production methods, you can count on coal being plentiful and its price remaining stable.

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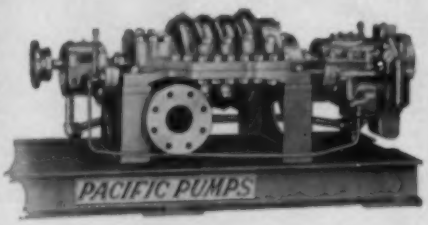

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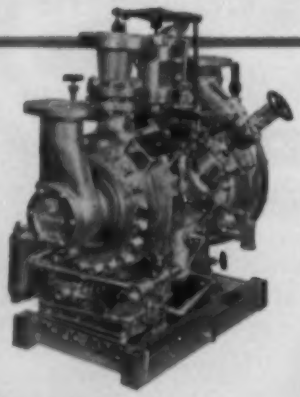

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if it be the general policy of the plant manager to practice the character and personality attributes of simplicity, earnestness, tact, courage, faith, loyalty, acumen, truthfulness and honor, and if he is suggestive and patient instead of dictatorial and over eager —then those under him who can call themselves gentlemen will warmly and enthusiastically respond to his leadership, while those above will respect the results made possible by the loyalty of the crew.

With all of the theories and practices of the subject reviewed in this paper thoroughly in mind, the logical and accepted conclusion would be to recapitulate the salient points for final emphasis. But instead, let us dwell a few seconds longer on the characteristics of a plant manager since his leadership may mean the difference in the color of the balance sheet at dividend time.

We have often heard a remark to the effect that, "That man is head and shoulders above everyone else," and you have also observed, no doubt, the admiring glances that are often cast at leaders of tall stature. Strangely enough, people have often been influenced in the selection of their leaders by physical height and depth of chest.

This does not mean though that to be a successful plant manager you necessarily have to be a large man physically. It does mean, however, that the plant manager should earnestly and conscientiously strive for the dimensions of height, depth, and broadness in his own personal integrity and technical knowledge. How deep does he think? To what depth does he consider the wide spread influence of his managerial decisions? How broad is this man in his field of technical and practical knowledge and in his understanding of human emotions?

Yes, whether the plant manager is to adhere to the principles set forth herein or develop a set of guiding policies all his own, he must of necessity be a leader with broad and deep understanding of the needs of the men whose loyalty can assure his success.

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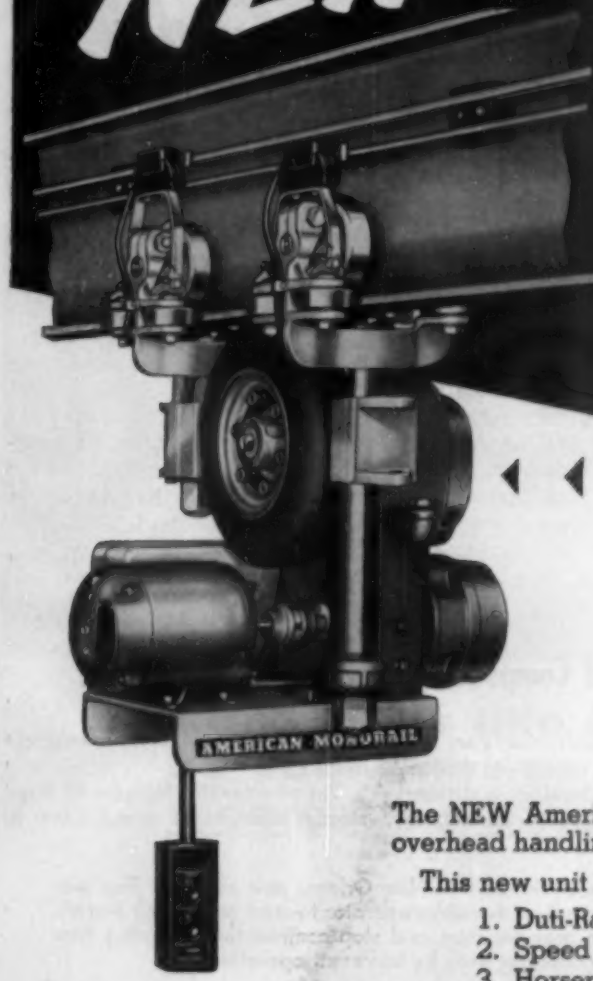

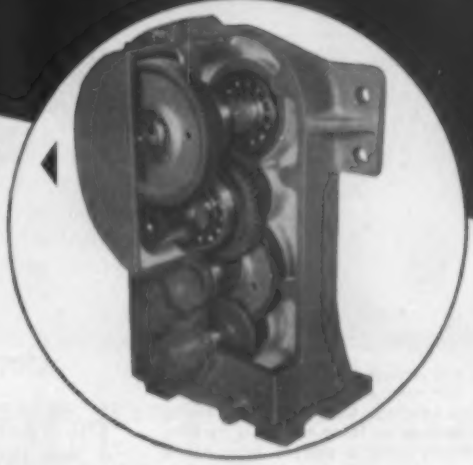

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This precision built tractor unit offers continuous trouble-free transfer of any type of carrier for power propulsion. American MonoRail engineers offer wide experience in the application of these units. Let them help you solve your automatic handling problems.

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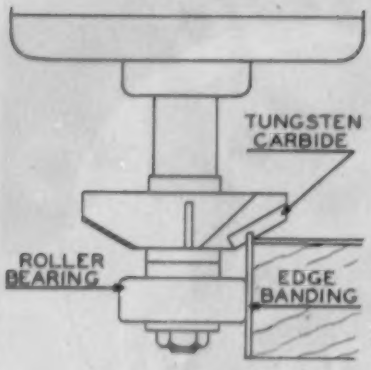
HELPING the *MAN-IN-THE-PLANT*

Ideas . . Methods . . Gadgets

Cutter Designed for Difficult Job



Cutter was designed to be used in a hand router that runs on the top while cutting the edge banding. Only adjustment necessary is to raise or lower router on its base (not shown) until a perfect flush cut is made.

DREXEL Furniture Company in Morganton, N. C., has its own tooling department, in which all carbide-tipped saws and other special wood-cutting tools are designed and made.

An example of the special designs made is a cutter developed for cutting the laminated plastic edge banding flush with the plastic laminate on a case top. Because of very slight differences in the thickness of the tops, the operation cannot be done satisfactorily on an ordinary router that would gage the cut from the bottom while cutting on the top.

The cutter was designed to be used in a hand router that will run on the top while cutting the edge banding. By placing a ball bearing on the spindle below the cutter, a guide is formed that keeps the cutter the same distance from the edge. The cutter is beveled to cut the band exactly flush without danger of scarring the top. The only adjustment to be made is that of raising or lowering the router on its base until a perfect flush cut is made.

Since plastic laminate is very hard, an ordinary high-speed cutter will cut only a short time before regrinding is necessary. For that reason, this cutting edge is made of tungsten carbide, which cuts about fifty times longer before regrinding than high-speed steel. In order to prolong the use of the cutter even more, the size of the ball bearing is changed so that a new section of the carbide cuts the banding. Different size bearings can be used on the same spindle by pressing bushings into the larger bearings.

Cutters of this type may be purchased from carbide wood-cutting tool manufacturers, but Drexel has found that it can reduce expense and better utilize its existing machines by custom making the spindle for the router on which it is to be used.

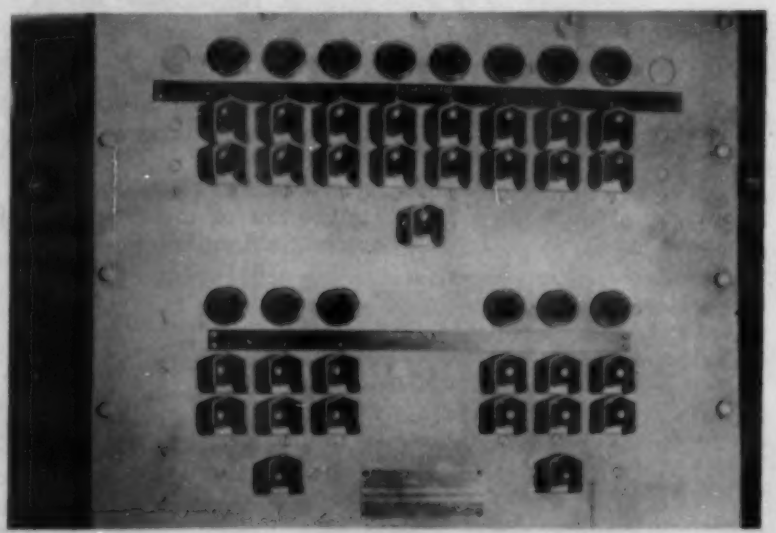
By L. S. INSCOE, JR., Drexel Furniture Company, Morganton, N. C.

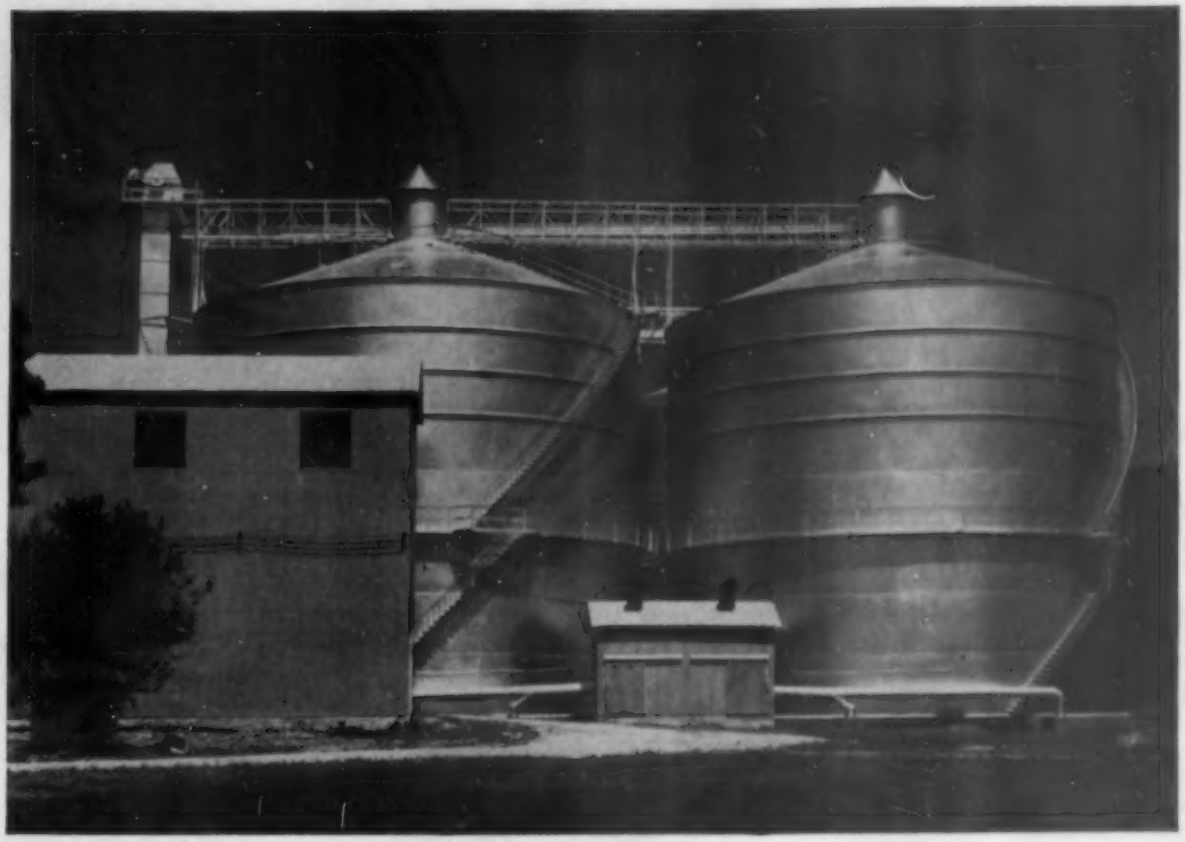
Electrical Components in Dust-Tight Enclosures

TO SAFEGUARD the Port of New Orleans' new $7½ million Public Grain Elevator addition, Crouse-Hinds Company's dust-tight electrical equipment is extensively used.

The new facility includes 81 large storage bins, eight new 150,000 lb

SCALE office at the Port of New Orleans new elevator. Top section of this panelboard enables operator to start or stop leg motors. Lower section provides start and stop controls for controlling flow of grain onto conveyor belts by basement operators.





CB&I tanks like these may be your answer for clean, dry storage

Shown are two 200,000-bushel Horton® steel tanks installed for soybean storage at the Osceola Products Company, Osceola, Arkansas. They are 70-feet in diameter and 60-feet high. A ventilating system in the bottom of each tank draws air down through the seed and cools it whenever excessive moisture causes the contents of the tank to become heated.

Perhaps this installation will suggest the answer to a problem that you may have involving the storage of clean, dry, free-flowing products.

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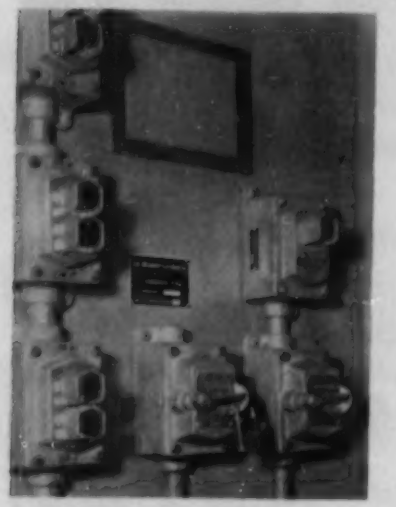
hopper scales, eight new 30,000 bushels per hour legs, six of which are used as shipper legs and two as receiving legs, and two transfer belts to carry grain between the old elevator and the new. Completion of the addition increases capacity to approximately five million bushels.



MOUNTED inside the passenger elevator, these dust-tight Crouse-Hinds enclosures protect the elevator floor station switches.

Hazardous Condition

Continuous handling and storage operations of this nature cause dust particles to float in the air and then settle on walls, floors and equipment. When the dust settles on electrical equipment, it brings the particles into close contact with apparatus that can easily provide a source of ignition.

Dust, if present in sufficient quantities and mixed with the right amount of air, can produce explosive mixtures. If the deposits accumulate to the degree that the safe dissipation of heat from electrical equipment is prevented, or if the deposits are exposed to ignition by arcs or sparks from electrical apparatus, the deposits are potential sources for flash fires.

Therefore, in operations of this nature, electrical components must be housed inside dust-tight enclosures that also dissipate heat rapidly even when shrouded by layers of dust. Lighting fixtures, motors, etc., must have tightly gasketed housings shaped so that they dissipate heat at a higher rate than ordinary electrical components.

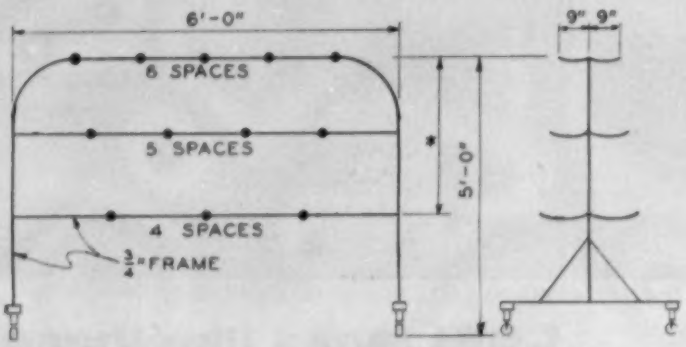
Photos show examples of the modern and efficient Crouse-Hinds installations in the Port of New Orleans' Public Grain Elevator.

Portable Gasket Rack

THE illustrated portable gasket rack was fabricated from scrap pipe and four casters.

Rack promotes orderly storage of gaskets and ample inventory. It can be easily rolled through refinery area, expediting piping maintenance, etc.

By URAL A. CROW, Pipefitter Helper, Pipe Dept., Baytown Refinery, Humble Oil & Refining Company, Baytown, Texas.



HYDRAZINE for Boiler Feedwater Treatment

THE present use of hydrazine as an oxygen scavenger in boiler feedwater, and some precautions based on investigations of hydrazine in England, were discussed in a pair of papers presented at the recent annual meeting of the American Society of Mechanical Engineers.

Richard C. Harshman, senior research engineer, and Eric R. Woodward, supervisor, Market Development Department, Olin Mathieson Chemical Corporation, said present applications in several American power plants prove that **corrosion caused by dissolved oxygen is being reduced by hydrazine without undesirable effects on boiler operation.** The maintenance of a hydrazine residual in the water was reported to protect the boiler against occasional increases in dissolved oxygen without interfering with the normal control of pH of the boiler water and without contributing to the total solids content of the water. Easy methods of application and satisfactory methods for control of dosage have been developed, the authors reported.

For complete oxidation of hydrazine by oxygen, 32 lb of hydrazine react with 32 lb of oxygen to give 36 lb of water and 28 lb of nitrogen. Practical experience has indicated that, upon initiating hydrazine treatment, the amount added should not exceed three times the equivalent oxygen content of the deaerated feedwater. Cleanliness of the boiler was reported to have a direct effect on the speed with which the initial hydrazine residual is established.

Hydrazine is applied in aqueous solutions. These alkaline solu-

tions have no flash point in concentrations under 40% N_2H_4. A small chemical proportioning pump provides a simple way to inject dilute hydrazine hydrate into the feedwater line against back pressure with positive control. It has been found practical when replacing sodium sulphite with hydrazine to use existing equipment.

Formation of ammonia is avoided by limiting the amount of hydrazine dosages. Conductivity of the condensate was reported to be useful as an indirect control on hydrazine dosage. Precise control of dosage requires analytical methods, two of which are available.

While acknowledging that hydrazine hydrate or dihydrazine phosphate provide an ideal chemical method for deaerating boiler feedwater, Jack Leicester head of the Chemical Engineering Division, Admiralty Materials Laboratory, Dorset, England, said **their successful reaction with dissolved oxygen is by no means universal.**

The hydrazine oxygen reaction in dilute solutions, as in boiler feedwater, appears to be a surface reaction the mechanism of which is not yet fully established. There is some evidence to indicate that it may be heterogeneous. Thus it appears impossible to predict that hydrazine will work satisfactorily in all types of boiler plants, the author believes. To assure complete reaction with dissolved oxygen some form of catalyst unit seems necessary in the feedwater supply, he said.

The decomposition of excess hydrazine to ammonia is an important factor in the completeness of the reaction and the degree of reaction occurring at oxide surfaces of the system. Not more than 0.3 to 0.5 ppm of ammonia is likely to be in the steam if hydrazine content of the boiler water does not exceeed 0.2 ppm. The danger of nonferrous metal corrosion from ammonia must be prevented by an accurate metering system for the dosage of

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hydrazine, Mr. Leicester concluded.

Experimental studies of the hydrazine-oxygen system are continuing, Mr. Leicester said, because it now appears impossible to predict the efficiency of the reaction for a universal boiler application.

Copies of the Harshman-Woodward paper, No. 54-AA-124, and of the Leicester paper, No. 54-A-123, may be obtained at 50 cents each from Order Dept., ASME, 29 W. 39th St., New York 18, N. Y.

Flywheel Support Stand

THE illustrated specially designed stand is used to support flywheels when they are removed from engine and compressors in refinery. Primary advantage is the reduction in the number of times the heavy flywheels must be handled after removal from the compressors, etc.

Formerly the riggers had to lay the flywheels in a horizontal position each time they were removed. Riggers were also reported to stand by or make extra trips to turn the flywheels during sandblasting, magnafluxing and inspection procedures.

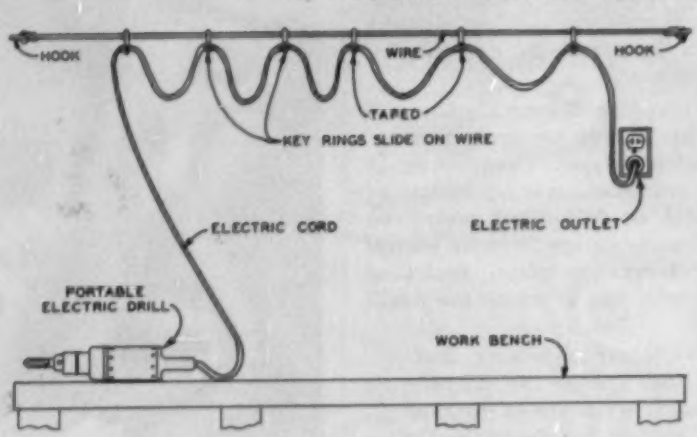
This stand permits the flywheels to remain in a vertical and balanced position at all times. They can be easily rotated for inspection purposes.

By ANTON LEIBHAM, Rigger, Baytown Refinery, Humble Oil & Refining Company, Baytown, Texas.

Electric Cord Support

WHEN a portable drill, reamer, tapper, nut runner, etc., is used regularly at the work bench, a wire with keyrings attached, as shown, can be employed to support the electric cord and prevent its becoming tangled with other objects on the bench.

By THOMAS TRAIL, Catonsville, Maryland.



Care and Cleaning of Paint Brushes

By ROBERT F. CLOTHIER

FIRST, it is important always to buy the highest quality brushes. They give the best service and, in the long run, are the most economical. It is a fact that one which is well made can be used effectively until its bristles have been worn to one-half their original length.

A new brush should be cleaned before using. The purpose of this initial cleaning is to remove any dirt or foreign matter which may cause trouble, and to remove loose bristles. They can be conditioned or "broken in" as follows:

1. Work the brush back and forth over the edge of a table or the palm of the hand to remove loose bristles, which all new brushes are certain to contain.
2. Wash in paint thinner or turpentine.
3. Work out the solvent on a clean wood surface or on clean paper towels.
4. One additional step which is highly recommended (but which may be eliminated if the brush is to be used immediately) is to suspend it in raw linseed oil over night. Do not let the bristles rest on the bottom of the container or they may become permanently bent. Squeeze out the excess oil and wrap in wax paper for storing.

Cleaners

Although there are many general purpose cleaners, it is frequently easiest to clean a brush with a solvent suitable for the particular class of paint used; that is, whether it is alcohol base (shellac), turpentine base (oil paint or varnish), and the like.

In any case, the procedure for cleaning is as follows:

1. Squeeze out all excess paint.
2. Wash in suitable cleaner (benzol, alcohol, turpentine, or one of the formulas given herein).
3. Wash carefully in soap and water.

4. Rinse thoroughly in warm water.
5. Allow to dry and then wrap in waxpaper.

Solvent Cleaners

Typical formulas which are excellent for general use are the following:

I. Benzol	2 parts
Acetone	1 part
Denatured alcohol	1 part
II. Benzol	1 part
Denatured alcohol	1 part
Acetone	2 parts

Although these will remove certain hardened paints they are recommended primarily for cleaning brushes which have just been used or where the paint has not hardened.

Alkaline Cleaners

These are excellent for reclaiming hardened paint brushes:

I. Trisodium phosphate (TSP)	1 to 2 lb.
Water	1 gallon

Allow brush to soak in the above until all the paint has softened. Since TSP is a solid and does not evaporate it must be rinsed out completely. Traces of this chemical can ruin a painted surface.

II. Trisodium phosphate	1 to 2 lb.
Sodium carbonate (dry)	¼ to ½ lb.
Water	1 gallon

This is quite effective for very stubborn cases, but, as with formula I, it must be washed from the brush completely.

Strong alkalies, such as lye (sodium hydroxide), are not recommended as brush cleaners because they may ruin the bristles if not used with caution.

Emulsion Type Cleaners

An excellent general purpose cleaner is the following:

Kerosene	8 parts
Oleic acid	4 parts
Ammonia (28% solution)	1 part
Denatured alcohol	

Mix the alcohol and ammonia together. Then, in a separate container, mix the oleic acid and kerosene. With stirring, add the alco-

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hol-ammonia solution to the oleic acid-kerosene solution. To use, soak brushes in the cleaner overnight; then wash thoroughly in warm water.

Storing

To preserve paint and varnish brushes for long periods of time it is recommended that they be kept suspended in a mixture consisting of one part turpentine and one part raw linseed oil.

Keep shellac brushes in denatured alcohol.

Keep lacquer brushes in amyl acetate or other lacquer thinner.

Pliofilm and polyethylene bags are excellent for storing dry, clean brushes. Use an oversize bag and tie a knot in it to close the open end. Always lay brushes flat or hang them so that the bristles will remain straight.

REFERENCES

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Anon: "Paint and Varnish Removers," LC749 Washington, National Bureau of Standards, 1944.

Forrester, G. P.: "Pharmaceutical Formulas," Volume II, London Chemist and Druggist, 1934.

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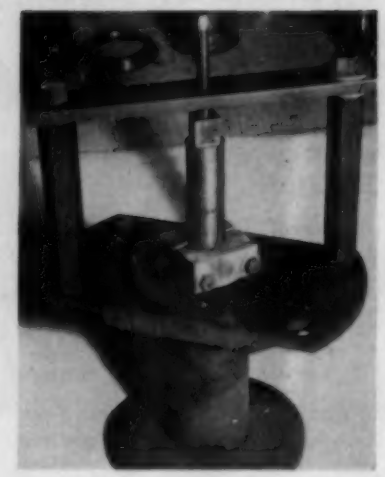
Bennett, H.: "Chemical Formulary," New York Chemical Publishing Company,

Valve Seat Facing Tool

REPEATED valve changes on compressors in "dirty" gas service, with the necessary cleaning, resulted in slight damage and roughing of the valve seat. This caused undue gas leakage between the compressor valve gasket and the valve seat.

The illustrated facing tool was designed to bolt onto the cylinder valve cover studs and reface the valve seating surface. This provided a smooth clean gasket surface that eliminated the leakage.



The entire operation requires only four minutes for each valve seat and can be performed during routine valve changes.

The tool is operated by hand and designed so that it could be easily made in any ordinary maintenance shop with minimum expense.

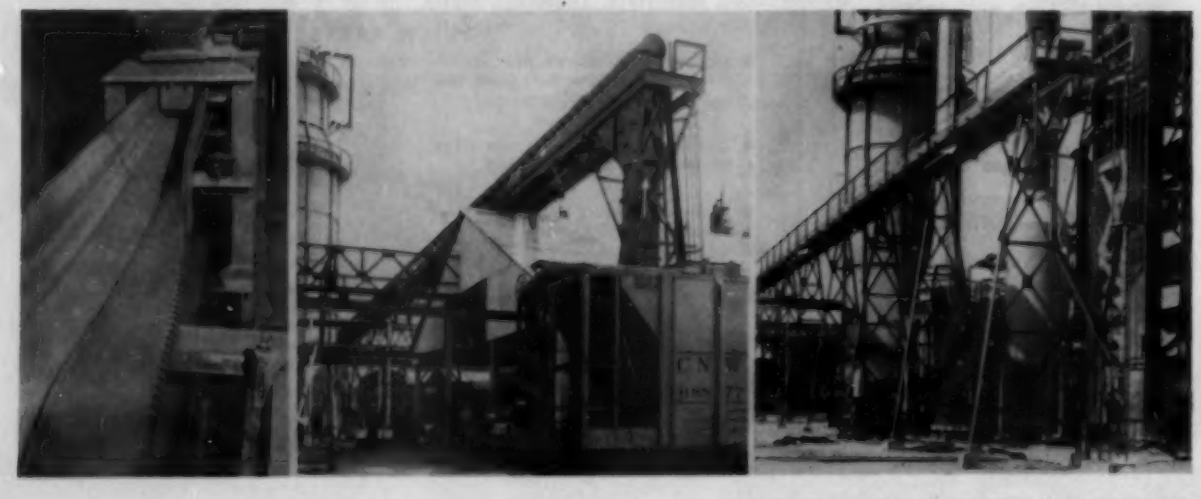
By N. T. ACOSTA, Foreman, Maintenance Department, Carbide and Carbon Chemicals Company, Texas City, Texas

Zipper Moves Catalyst Without Crushing

MOVING bead catalyst from closed bottom dump cars to a bucket elevator lifting to storage was "stymying" plant engineers at the Continental Oil Company near Lake Charles, Louisiana.

A conventional belt conveyor line was blocked at ground level by intervening buildings and the underground route via a tunnel meant cutting through foundations and relocating pipe lines. The obvious solution was an overhead path, but the additional lift required meant excessive degradation and power requirements with conventional conveyor equipment.

Left—Open belt rounds tail pulley and moves to loading point. Immediately after loading the sidewalls are "zipped" shut, forming a snug fitting tube around the material . . . Center—Enclosed hopper bottom car is shown in position to discharge to Zipper in shallow tunnel. After short horizontal run unit rises vertically to clear buildings . . . Right—View along 250-ft run of Zipper. Discharge and drive can be seen in foreground. A 5-hp motor powers the unit through a Saco speed reducer.



With these conditions in mind Continental engineers investigated the Stephens-Adamson Zipper conveyor and found that a single unit would follow the required overhead path. Even more important, they found degradation practically non-existent and power requirements extremely low. With these obvious advantages in mind a Zipper system was installed and put into operation.

Catalyst is delivered to the Continental plant in totally enclosed bottom dump cars, or in box cars. A side hopper or shallow bottom hopper gravity feed to the Zipper belt which runs for 20 ft in a 6-ft tunnel. It then makes a 35-ft lift before moving horizontally for a distance of 250 ft.

The Zipper conveyor-elevator system has a capacity of 10 tons per hour at a belt speed of 106 fpm. It is driven by a 5 hp motor through a Saco Speed reducer.

Since belt supporting rollers are small, structural supports are light and economical. Biggest advantage of the Zipper is, of course, its ability to move with the load. Immediately after the loading point the Zipper teeth are meshed, forming a snug fitting tube around the material so that it cannot shift on either horizontal or vertical runs.

* * *

$$$ For Your Ideas

Send your ideas, methods and short-cuts to Southern Power & Industry. Payment is made for suitable material—a photo or rough sketch will make your idea more valuable.

Articles from maintenance and production men in Southern and Southwestern plants are preferred. Material must not have appeared elsewhere nor been sent to another publication.

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Easily...Economically with Subalox

Subalox is a complete paint system, so easy and economical to use that a single coat gives an excellent and lasting job. Can be applied by customary methods, but for most satisfactory application we recommend floor brooms.

Subalox is based on a heavy collodial lead pigment which gives excellent rust protection and limits spattering when applied to wire mesh.

Subalox is available in a variety of colors—the most popular being the metallics used to simulate the appearance of galvanizing. Old fences can be given a "new look" which can be easily maintained with a minimum of time, labor and material cost.

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Equipment . . Supplies . . Methods

FOR FREE INFORMATION—Circle code number on pages 16 and 17

New All-Purpose Welder

C-1 THE LINCOLN ELECTRIC COMPANY, 22801 St. Clair Ave., Cleveland 17, Ohio, has introduced a new universal combination arc welder which provides a choice of either a-c or d-c welding current. Called the Idealarc, the machine is said to provide an ideal type of welding arc for every type of manual welding application, permitting selection of either a-c or d-c and either a soft or forceful arc.

The Lincoln Electric Company's Idealarc All Purpose Welders are available in 300, 400 and 500 amp a-c combined with d-c capacities in 200, 300, 375, and 450 amp.

The Idealarc is said to present an unusual opportunity for welders to select the proper welding arc for their application. The machine is available in several combinations. It can be obtained as an a-c welder without the d-c current. To this unit a d-c package can be easily attached in about one hour whenever desired. It is also available as a combination a-c and d-c machine with selection of either current made through a simple twist of a switch handle. Different output capacities of d-c and a-c can be combined to fit the machine to the job requirements.

The machine thus can be quickly set for maximum efficiency on every type of welding; ferrous or non-ferrous materials, sheet metal or heavy plate, all positions, and under arc blow conditions or poor fit up.

For a-c welding jobs the machine provides a single phase transformer type welder, the circuit of which has been designed to give greater arc stability than is normally associated with welding transformers. The machine is said to produce an exceptionally smooth spray type of transfer of metal.

Both voltage and amperage are controlled to give the desired control of arc characteristics. Dual-control has long been a feature of Lincoln's SAE type d-c welders but never before has been available on any a-c transformers.

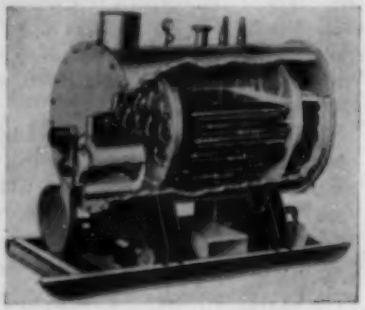
In addition to dual-control of the arc, the machine also has an arc booster switch for selecting normal or "hot" starting. The machine's inherent stability provides unusually good a-c current starting characteristics, but the switch permits controlling this to give efficient performance on different types of materials, in varying thicknesses and under different joint conditions.

For d-c welding, the Idealarc provides d-c welding current through heavy-duty rectifiers. Dual-control of the arc is provided and, in addition, ability to select either normal or "hot" starting with the arc booster. This is the first time choice of arc starting characteristics has been made available on d-c welders. The controls provided, combined with a design and construction that produce an easy steady arc, create a d-c machine with the quiet, efficient operation of rectifier welders with the versatility and operating ease of motor generator welders.

For more data circle item code number on the postage free post card—p. 17

New Boiler Uses Internally Finned Tubes

C-2 BROWN FINTUBE COMPANY, Elyria, Ohio, has introduced a new boiler which uses internally finned tubes to produce greater capacity, and greater efficiency in less space.



Brown Fintube's internally finned tube boilers are built in standard 30 hp, 60 hp and 100 hp sizes.

The internally finned tubes produce a fire-side to water-side surface ratio of about 3 to 1; as compared to fire-side to water-side ratio of only 1 to 1.1 for plain bare tubes. The Brown internally finned tubes provide almost 3½ times more surface area than plain bare tubes to pick up the heat and transfer it to the water. In addition, the internal finning increases the turbulency of the hot gases, and brings them into much more intimate contact with the heat transfer surface then is possible in a plain, bare tube.

A Brown Fintube 100 hp boiler with internally finned tubes is only about ⅝ as wide; ⅝ as long; and ⅝ as high as a bare tube boiler of equal capacity. These small and compact boilers can be installed where headroom is limited with consequent additional savings in building costs. Due to the high heat transfer rates of the finned tubes, the boilers are said to come up to full steam pressure in about ten minutes.

The boilers are completely self-contained, modular units. Any number of boilers can be connected together with inter-locking controls to provide any capacity a plant may need. All parts readily accessible for inspection and cleaning.

Heavy Bar Type Pullers

C-3 SNAP-ON TOOLS CORPORATION, Kenosha, Wisconsin, announces the availability of a new heavy bar type puller. Power and versatility are big features of this industrial puller that provides up to 50 tons of power for big machinery jobs.

Snap-on Tools Corporation's Heavy Bar Type Puller provides up to 50 tons of power.

The yoke is machined from 2½" square stock and is 16" long. The grooves for the side rods extend to within a short distance of the center pressure screw so objects can be pulled with openings or tapped holes a minimum of 6" apart, center to center. The side rods are threaded at both ends for greater ease in setting up the puller. Two short extension rods, 9" long, and two long extension rods, 18" long, are included in the set.

Where additional reach is necessary to remove an object set far back on a shaft, the rods can be threaded together by means of the connecting nuts. These nuts have a stop in the center so that both screws will be threaded an equal amount for maximum strength.

To increase the rigidity of the side rods and to make the unit adaptable for pushing or pulling, an extra set of nuts is included which can be threaded on the rods to contact the underside of the yoke. Tightening the top nuts then locks the rods and yoke together into a single unit. For pulling large spoke wheels, etc., two adaptor blocks 8" x 2½" x 1¼" can be slid over the side rods and then held in position in back of the wheel by two nuts. This provides additional bearing surface and allows the puller to adapt to almost any type of wheel construction.

"This Wing Draft Inducer is great! I don't have to touch it... never have to lubricate it... it never requires attention"

The new Wing Draft Inducer has many unique features:

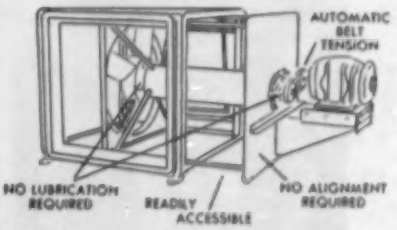
★ Gas Inlet may be at top, bottom or any side—may easily be changed in the field.

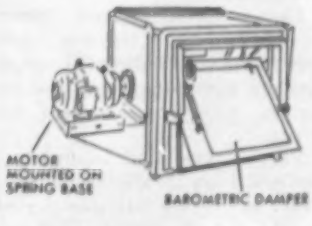
★ Unit may be withdrawn from casing for inspection or service.

★ No lubrication required—Pre-sealed bearings air-cooled.

★ No alignment required—no need for field alignment before start-up.

★ Motor belt always at correct tension.





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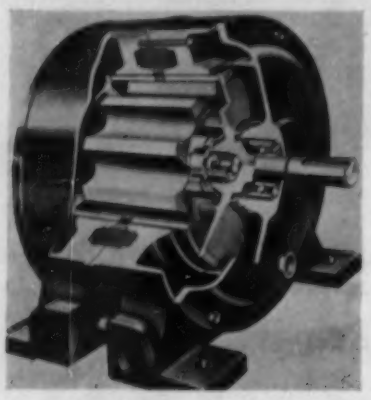
Equipment . . Supplies . . Methods (Continued)

Adjustable Speed Drive

C-4 EATON MANUFACTURING COMPANY, 3307 Fourteenth Ave., Kenosha, Wisconsin, has developed a new adjustable speed drive called the Dynaspede Coupling.



Cutaway view of liquid-cooled stationary field (Dynaspede) Coupling.

It is a stationary field, liquid cooled, eddy-current adjustable speed power transmission device. Driven by a constant or variable speed power source, the Dynaspede Coupling delivers torque or speed to suit specific processing requirements.

The absence of all rotating electrical components—slip rings, brushes, commutators and coils—provides superior performance, reflected in reduced maintenance and adaptability to hazardous, moist, dirty and other adverse locations.

Liquid cooling efficiently provides an effective heat transfer medium, permitting very wide speed ranges at constant or reduced torque and, under certain conditions, constant horsepower.

Various types of easily applied controls, from an alternating current power source, provide step-less speed control and almost unlimited special process requirements.

Bronze Gate Valves

C-5 R-P&C VALVE DIVISION, AMERICAN CHAIN & CABLE COMPANY, Reading, Pa., has announced a new line of bronze gate valves for general full-flow service on steam, oil or gas. Sizes range from ¼ inch to 3 inches.

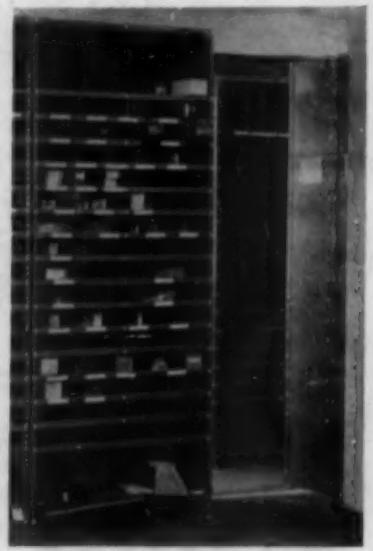
Available in either split or solid wedge, these valves are equipped with a rising stem which gives a visual indication of the position of the wedge. Its operating threads are out of direct contact with the fluid. Each valve is given hydrostatic shell and seat tests at the factory and is designed for a working pressure of 150 lb.

The split wedge is especially suited for use where body seats might be slightly distorted due to pipe line strains. This taper type split wedge is well guided and accurately machined to assure positive, easy operation. The solid wedge is designed for general use, and is particularly adapted for steam service. There are no loose parts to vibrate or wear as with a two-piece disc.

Adjustable Shelving

C-6 THE STANDARD PRESSED STEEL COMPANY, Jenkintown, Pa., is marketing a new line of steel shelving with more than 1000 different combinations permit the custom assembling of an installation for virtually all kinds of storage needs.

The shelving, which comes with or without sides and back, can be arranged for use along production lines, in tool shops, etc.



Shelves which can be adjusted in height on one-inch centers and dividers and bin fronts are features which make Standard Pressed Steel Company's new line of shelving ideal for machine shop and tool room storage.

Units for the storage of tools or parts, or books, or towels, or almost any temporary or long-time storage item can be bolted side by side for any desired length. And they can also be bolted back to back. All bolts and nuts are cadmium plated as protection against corrosion. The shelving comes in green enamel which is baked on over a bonding phosphate coating.

The new Hallowell shelving components include posts, side and back panels, shelves, full and partial dividers, bin fronts, braces, label holders and swinging and sliding doors.

Shelves come in 35 different sizes, from 24 in. x 9 in. to 48 in. x 36 in.

Power Shear for Cutting Angles and Flat Iron

C-7 BATEMAN FOUNDRY & MACHINE COMPANY, Mineral Wells, Texas, is producing a new Shear which makes a clean cut of small angles up to 2 in. x 3/16 in. and flats up to ¼ in. x 4 in. without grinding. By opening the clutch, 44 strokes per minute may be obtained. Manufactured of high grade case iron with hardened clutch, clutch pin and shear blades. Clutch is operated by hand or foot as desired.

The Bateman Shear is equipped with a flywheel and gear drive for power with a ¾ hp motor; requires 24 in. x 27 in. of floor space; height from floor to top of machine—56 in. with stand; height from floor to shear blades—36 in.; shipping weight, 645 lb. Shear is available with motor and hand switch for $450.00.

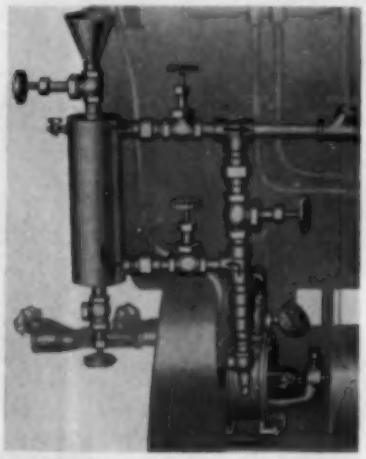
FOR FREE INFORMATION—Circle code number on pages 16 & 17

new equipment (continued)

For more data circle item code number on the postage free post card—p. 17

Economical "By-Pass" Water Treatment Unit

C-8 CYCLOTHERM DIVISION UNITED STATES RADIATOR CORPORATION, 157 E. First St., Oswego, N. Y., has introduced a simple, inexpensive water treatment device to be used where water or boiler conditions do not justify the installation of expensive mechanical proportioning equipment to treat boiler make-up water.



Cyclotherm's chemical by-pass water treatment system is especially suited to low hp boilers, installations where new make-up water is added infrequently, or in geographical areas where water composition does not demand exceptionally heavy treatment.

The "Chemical By-Pass Feeder," as it is called, avoids excessive feed pump wear by introducing water treatment compounds on the discharge side of the boiler feed pump. This eliminates the pump wear usually caused by abrasive materials in the powdered water treatment compounds.

The unit can be used to add either liquid or powdered water treatment chemicals to boiler feedwater on any hot water or steam generator, regardless of make. The tank on the By-Pass Feeder has a capacity of two gallons. With the by-pass design, boiler feedwater can be introduced through the tank containing a previously measured amount of water treating compound, or it can feed straight through from feed pump to the boiler, simply by adjusting three valves.

One of the South's largest varieties of steel warehouse products assures you of in-stock items. 15 main line railroads and 75 major motor freight lines assure you of rapid delivery. Add the South's most modern warehouse facilities and you have a combination hard to beat when you need steel in a hurry—one piece or a carload. Call us and see what service *really* means.

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Equipment . . Supplies . . Methods (Continued)

Deaerating Heaters

C-9 FRED H. SCHAUB ENGINEERING COMPANY, Chicago, Ill., has announced a new design deaerating heater, the "03," capable of reducing oxygen content in boiler feed water down to .03 cc per liter.

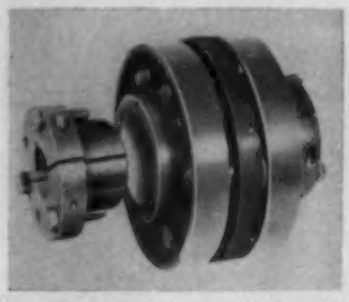
Design features "floating" temperature control at 211 F, through one or more internal non-ferrous steam distributing tubes, with control by means of a highly sensitive combination temperature and pressure regulator which is responsive to a ¼ temperature change at the bulb.

Like all Schaub deaerator designs, the "03" operates with an unrestricted vent for free release of all non-condensible gases. Vent condenser is of the direct spray contact type.

Costly pressure type shell construction with internal baffling, pressure relief valve, and overflow trap are all eliminated in this design. Sizes available to handle loads up to 1,000 hp or 30,000 lb/hr.

Heavy-Duty Flexible Coupling

C-10 CLIMAX METAL PRODUCTS COMPANY, 863 East 140th St., Cleveland 10, Ohio, have announced a line of heavy-duty flexible couplings employing the "knob-disc" flexible medium, and equipped with split-taper bushings for quick mounting.



Climax Q.D. Couplings are available with bushings in 1/16" shaft diameter increments over the entire bore range.

In addition to providing easy shaft handling, the split-taper bushing enables the coupling to be used to connect shafts or different sizes.

The split-taper bushing is of one-piece construction, with a socket-head cross bolt across the compression slot. Two split-taper bushings are used to mount the coupling, one to the "driver," the other to the "driven" shaft. When the jack screws are drawn up, the tapered bushing hub is compressed by the matching taper of the coupling bore for a positive, press fit on the shaft. All bushings are provided with standard keyways.

Due to the use of split taper bushings, the Climax Q.D. Coupling will accommodate the widest range of shaft sizes. The couplings are available in 8 sizes based on hp ratings up to 75 hp at 100 rpm.

Design features of the flexible member enables the coupling to effectively absorb shock, vibration, backlash and misalignment, according to the manufacturer. Absence of mechanically moving parts, or metal-to-metal contact is said to result in a coupling impervious to moisture, dirt, and abrasive particles.

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When your heat exchanger or condenser or other tubular equipment suddenly quits . . . IT'S AN EMERGENCY . . . you spin your phone dial . . . and in minutes, day or night, Sundays or holidays, a CONSECO REPAIR CREW is speeding to your plant. Expert, fast, doing in hours what otherwise would take days . . . they're equipped with special tools and all the tubes, tube sheets or specialties you need, drawn from our complete stock. Yes, CONSECO SERVICE is as near as your telephone. Call our Maintenance Department.

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Designers and Builders of Equipment for Power, Refining, Chemical and Marine Industries

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Hoboken, N. J.

new equipment (continued)

For more data circle item code number on the postage free post card — p. 17

Portable Demineralizer

C-11 THE PERMUTIT COMPANY, New York 36, N. Y., has developed their model MBD-6A Demineralizer for the production of small quantities of pure water. The compact, portable unit contains a bed consisting of a mixture of Permutit Q, a cation exchanger and Permutit S, and a highly-basic anion exchanger. It is used to produce a water of low total dissolved solids, low CO_2, low silica content and low conductivity.

In service, the inlet hose is connected to a raw water supply and the outlet connected either into a pipe line or left free to be put into any container where water is required. The faucet, to which the raw water inlet adapter is fastened, should be used to regulate the flow through the unit. Flow rate is 1 to 2 gpm maximum.

A conductivity meter (not shown) is used to indicate the dissolved solids content of the effluent water and will thus show when regeneration of the exchange resins or a new refill is required. The unit has a capacity of approximately 1,500 grains total dissolved solids. During each cycle or run, it is capable of demineralizing 250 gallons or raw water containing 100 ppm total electrolytes; or 125 gallons of raw water containing 200 ppm total electrolytes. When the unit is exhausted, the resins may be removed, discarded and replaced with a new refill. However, the resins can be regenerated, and re-used.

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GRATING APPLICATIONS: floors • platforms • walkways • catwalks • stair treads • fan guards • shelving • and many other uses, both outdoors and indoors, for versatile steel grating

Equipment . . Supplies . . Methods (Continued)

Cooling Tower

C-12 J. F. PRITCHARD & Co., 908 Grand Ave., Kansas City 6, Mo., has introduced a new line of mechanical draft cooling towers for air conditioning and small industrial applications.

Manufacturer claims that their new "Lo-Line" induced draft tower has the lowest silhouette of any tower of 75 ton capacity or larger.

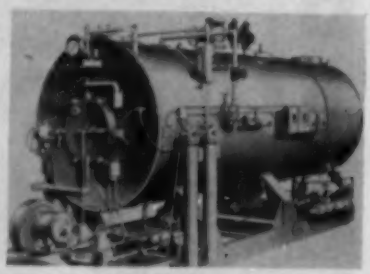
With its low overall height and attractive exterior casing of corrugated cement asbestos board, it meets the trend toward suburban building and also the demand of metropolitan buildings where cooling towers must still be mounted on the roof. The low silhouette can be easily concealed.

All lubrication fittings have been brought to the outside of the tower where they may be reached without the aid of ladders. All steel parts are hot dip galvanized and stainless steel is employed in the fan shaft.

A full range of sizes is available to handle air conditioning loads of 75 tons and up.

Package Boiler

C-13 AMES IRON WORKS, INC., Oswego, N. Y., is in full production of its Model X Packaged Steam Generator, built to the same specifications as its Model A (Amesteam Generator) line, but delivering equivalent horsepower in smaller physical space.



Ames Iron Works' Model X package boiler is available in 19 sizes, 15 to 600 hp. for pressures from 15 psi to 200 psi.

Of three-pass design, the new Model X has a minimum of four square feet of heating surface per boiler horsepower and is priced lower than the Model A. It is shipped as a ready-to-fire unit, complete with burner, controls, insulation and jacket.

Direct Lift Solenoid Valves

C-14 J. D. GOULD COMPANY, 730 E. Washington St., Indianapolis 2, Ind., is marketing new direct lift solenoid valves made in brass (Type F) and stainless steel (Type G).

Special feature, according to the manufacturer, are the unusually high maximum pressures possible. These are 1,000 psi for air and gas; 600 psi for water; 500 psi for oil, and 200 psi for steam.

The new valves have renewable metal seats and coils are interchangeable with those of other Gould valves.

Among the special assemblies available on both new types are silicone

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FOR a century Cole elevated tanks have provided a dependable water supply for mills and communities. Cole quality is assured by careful, experienced designing and watchful supervision from blueprints to finished tank. Send us your inquiries for tanks from 5,000 to 2,000,000 gallons —stating capacity, height to bottom, and location.

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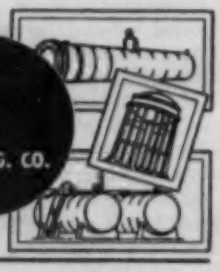
NEWNAN, GEORGIA

ELEVATED TANKS • VESSELS • CYLINDERS
TOWERS • BINS • STANDPIPES



Designed for general service, the new J. D. Gould Co. valves are made in ⅛" and ¼" pipe sizes with ports from 1/16" to ¼".

coils for high temperature applications and leak proof seating assemblies.

List prices start at $11.50 for the brass type, and $15.00 for the stainless steel type.

Cooling Tower Trouble

(Starts page 58)

mended the double row radial-thrust roller bearings which are shown on the right and left sides of the illustration of bearings and lubricant. These bearings have a combined radial-thrust load rating of 1690 lb with a minimum life expectancy of 15,000 hours.

They were selected because of their generous thrust load capacity, ease of adjustment to compensate for wear after long service, self-alignment feature which insures free-rolling action and prevents binding under load, and ample roller surface which provides about 60% contact at normal load. They have also proven their ability to withstand severe vibration and shock loads due to sudden gusts of moisture vapor arising from the cooling tower baffles.

In applying this particular flange unit to the bearing housing, the original holes in the housing had to be welded shut and new holes drilled and tapped to accommodate the new flange. One of the illustrations shows the top bearing installed. The shouldered shaft had ⅛ in. removed from the top of the collar to allow clearance between the bottom

. . . ready made bearings that meet many requirements

Every size of the 854 different Bunting stock bearings is selected with scrupulous, painstaking care. Each individual bearing not only fits many common applications in all kinds of industrial machinery but can be altered quickly and economically for many other and unusual requirements.

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Your Bunting Distributor carries in stock for your money saving convenience completely machined and finished Bunting Standard Stock Industrial Bearings, Electric Motor Bearings and Precision Bronze Bars in a complete range of sizes, meeting all your usual production and maintenance needs. You will find him listed in the classified section of your telephone book—most likely under the heading Bars, Bronze or Bearings, Bronze. Your Bunting Distributor is an industrial distributor or a specialist in certain industrial items. He has been especially selected for his responsibility and his understanding of bearing requirements. Ask him for the Bunting Catalog or write.

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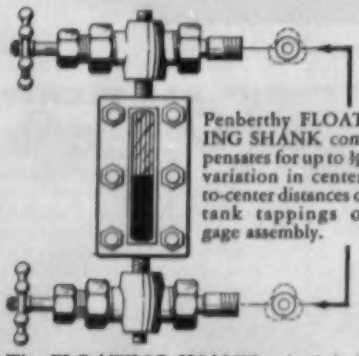
PENBERTHY GAGE VALVES WITH

FLOATING SHANK

SAVE TIME and TROUBLE

Take a look at the tail pipe of the valve pictured here. Notice that it is adjustable in relation to the body of the valve.

This "floating" feature adds flexibility in mounting. It compensates for inaccurate center-to-center gage assemblies or variations in tank tappings... up to ⅛". Since a normal gage and valve assembly involves four threaded connections, the time saved in installing is appreciable. In addition, mounting stresses are eliminated.



Penberthy FLOATING SHANK compensates for up to ⅛" variation in center-to-center distances of tank tappings or gage assembly.

The FLOATING SHANK principle is a patented feature available only on Penberthy Gage Valves and at no extra cost. Ask your supplier to furnish these valves for *all* your gage requirements — new installations and replacements. Use the coupon to obtain detailed information on the Penberthy line of Liquid Level Gages and Gage Valves.

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PENBERTHY INJECTOR COMPANY
Division of Buffalo-Eclipse Corporation
1342 Holden Avenue, Detroit 2, Michigan

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bearing inner race and the fan hub.

The last photo shows the mechanic making the final adjustments to the bolts which secure the individual fan blades. Each blade has been carefully set to a predetermined pitch by means of a bevel protractor used on each blade at a point 18 in. out from the hub. The fan had been previously balanced to prevent vibration.

Both top and bottom roller bearings have been lubricated with Lubriko lubricant. This particular type of lubricant was used because of its ability to withstand heat, cold, moisture, and other adverse operating conditions.

The cooling tower now operates very quietly, and cannot be heard over 50 to 100 ft away. Formerly, it could be heard 1 mile away at night. Our friends in the neighborhood, who formerly protested, have expressed their appreciation to us for our efforts at noise elimination. We are very highly pleased with the quiet and efficient operation of the cooling tower, upon which our entire air conditioning system depends for cooling water.

Reduce Corrosion

(*Starts page* 54)

cation is needed to avoid points of stress concentration.

Under some corrosive conditions, the most practical approach is to avoid the use of stainless steel entirely. For example, a chemical company had for a number of years successfully operated vessels of Type 304 stainless steel to condense organic solvents containing traces of acetic acid. Accordingly, when the company's facilities were expanded, the same material was specified.

After only a few months' operation the new equipment developed cracks in the shell. Metallographic examination of the failures revealed cracks right across the grains of the steel, a condition diagnosed as stress corrosion, and associated with the presence of chlorides. In this case, the trace of chlorides in the process stream was so minute as not to be detectable by usual methods of analysis, and it was felt not to be practical to eliminate this trace.

Theoretically, stainless vessels fabricated with special care taken to avoid points of concentration of tensile stresses should not be vulnerable to stress corrosion. In this instance, however, there was another and more promising alternative. Vessels of copper had given good service under similar conditions, and copper is not as sensitive to traces of chlorides as is stainless steel. Copper is also a suitable material for use with acetic acid as long as there is little or no oxygen present. Since price, too, favored copper, replacements of that metal were ordered.

One operation in the production of acetic anhydride requires heating acetic acid vapor to 1100 degrees. If any of this hot vapor escapes it will spontaneously burst into flame, so special precautions must be taken to prevent leaks. This vapor is heated in molybdenum bearing stainless steel tubes. Prolonged exposure of this steel to the 1100-degree temperature results in slow formation of a chrome-iron alloy with great increase in hardness and brittleness. For safety, this piping is completely replaced after 20,000 hours of service.

Inspecting for Corrosion

Since laboratory tests will not often be conclusive, and since minor process changes may have an unexpected effect on corrosion rates, periodic inspections of equipment should be scheduled. Placing test racks bearing specimens of different materials in the process equipment will be a further check on comparative resistance.

Reduction of corrosion losses will require the development of a systematic plan, with regular follow-up, but in the modern chemical, synthetic, or other manufacturing plant this can be an important factor in maintenance and can offer worthwhile savings. It is a field where the plant engineer can make a valuable contribution to the profitable operation of his company.

News (continued)

(*Starts page* 10)

Shewmake Now President of Southwestern El. Serv. Co.

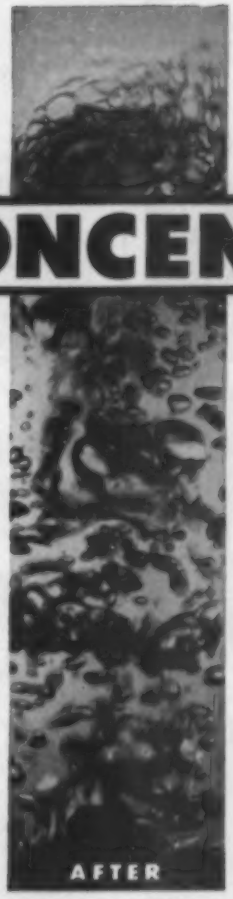
JOHN T. SHEWMAKE has been elected president of the SOUTHWESTERN ELECTRIC SERVICE COMPANY, and Carl S. Makeig, who has been president since the organization of the utility in 1945, has been named chairman of the board.

Shewmake, a vice president of the Southwestern Electric Service Company for the past seven years, has been active in the electric utility business for over thirty years. He is a native of Georgia and, following his graduation from Georgia Tech in 1923, began his business career with Stone and Webster, Inc., in Boston. Subsequently, he served in various positions with electric utility companies in Seattle, Jamaica B. W. I., El Paso, Galveston and Lubbock, Texas, prior to entering the armed forces in April, 1942.

The Southwestern Electric Service Company, an electric utility serving areas in Central-East Texas, had just been organized when Shewmake returned to civilian life and became associated with this company. In 1947 he was elected vice president and has since served in various executive capacities. The Company maintains its executive and industrial departments in Dallas where Shewmake now resides.

Makeig has taken a prominent part in the development of the electric industry in the Southwest for many years. As a young man, he began his career in the electric offices at Cleburne, Texas, later moving to Waco where he worked in the public utility offices there. In 1916 he moved to Amarillo to begin a period of thirty-eight consecutive years with the present and predecessor companies. In 1919 he became secretary of the utility and was named manager in 1925. From 1927 to 1930, Makeig served in managerial duties with affiliated companies in New Mexico and Louisiana, returning to Amarillo in 1930 as general manager of Southwestern Public Service Company. In 1934 he was elected president, the position he relinquished in 1945 to become president and director of the newly organized Southwestern Electric Service Company.

Laboratory demonstration shows foaming of highly alkaline solution in glass test cylinder.



Same solution after addition of 12 ppm of Bird-Archer Concentrol antifoam.

CONCENTROL

LOW COST CHEMICAL METHOD

FOR CONTROLLING FOAM

AND BOILER WATER CARRYOVER

LABORATORY PROOF

● Tests and plant operating records in all parts of the country have established the effectiveness and economy of Concentrol chemical treatment to combat wet steam problems. Where boiler water carryover is caused by foaming due to high alkalinity and high proportion of dissolved solids in the water, Concentrol is essentially a surface active agent that causes breakdown of bubble film, preventing foam formation.

Concentrol is supplied in liquid, powder or briquette form—can be fed either continuously or in slugs to boilers. Formulations of Concentrol can include organic sludge conditioning agents and other water treatment chemicals for boiler treatment as well as antifoam. Concentrol eliminates the need for costly pre-treatment of water and high blow-down rate. It is fast acting and resistant to hydrolysis or breakdown under normal boiler temperatures and pressures.

A Bird-Archer 8 Point Service Engineer is as near as your phone. For friendly counsel call him or write directly to Bird-Archer outlining the details of your boiler operations.

Engineering plus Chemistry equal Bird-Archer Service

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C. H. Rogers and Associates, 1969 Peachtree St., N.E., Atlanta 9, Ga.; L. H. Ward Co., 2609-11 Canton St., Dallas 26, Texas; 1314 Texas Avenue, Houston 3, Texas; Ransom, Wallace & Co., 114½ East Fourth Street, Charlotte 2, N. C.

News (continued)

$10 Million Expansion for Atlantic Steel Company

A $10 million modernization and improvement program, recently approved by ATLANTIC STEEL COMPANY stockholders, includes the construction of a new merchant bar and rod mill ($8,735,000); a second electric furnace ($750,000); and construction of a new administration building ($450,000).

The proposed new bar and rod mill will substantially increase the ATLANTA, GEORGIA, company's productive capacity, product range and sales potential.

Atlantic Steel's present bar mill was built in 1904. Products made on the mill have been a mainstay of the Dixisteel line for 50 years.

The new $10 million modernization and improvement program supplements the $6 million spent since the war on the modernization and expansion. Some of the completed improvements include: installation of the largest, most modern electric furnace in the Southeast; re-equipping and modernization of the wire and nail mills; purchase of new diesel locomotives; installation of additional galvanizing equipment; and establishment of a modern Warehouse Division. Construction is currently underway to expand the Warehouse Division facilities at a cost of about $275,000.

Founded in 1901 by a group of business and professional men, the company first produced only cotton ties and cooperage hoop. Through the years its product line has expanded to include today some 62 different items in thousands of sizes and shapes. Occupying more than 200 acres of land, the company now employs 1800 persons, and the payroll runs around $8 million annually.

G. E. Breaks Ground for N.C. Outdoor Lighting Plant

The ground-breaking ceremonies for a multi-million dollar manufacturing and headquarters building for GENERAL ELECTRIC COMPANY'S Outdoor Lighting Department were conducted in February at HENDERSONVILLE, NORTH CAROLINA.

This mountain community selected by General Electric in December to be "the Outdoor Lighting center of the world" held open house with state, civic and industrial leaders from throughout the Carolinas and the South.

Luther B. Hodges, Gov. of North Carolina, and Philip D. Reed, Chairman of the Board of the General Electric Company, participated in day-long festivities planned by the Hendersonville Chamber of Commerce, General Electric and other community groups.

L. BYRON CHERRY, general manager of General Electric's Outdoor Lighting Dept., who will make his headquarters at the new plant, said construction will be pushed to completion as early as possible in 1956.

The plant eventually will employ about 600 persons in the research, development, manufacture and sales of street, traffic, flood and all other outdoor lighting. Occupying a site of 60 acres, it will contain more than 200,000 sq ft of manufacturing and office floor space.

Childers Mfg. Expands National Distribution

BOB CHILDERS, president and general manager of CHILDERS MFG. CO., Houston, Texas has recently announced the appointment of the P. J. O'Meara Company, San Francisco as sales and engineering representatives for Childers Aluminum Weather-Proof Jacketing for insulated lines. Childers Aluminum Jacketing provides weather protection for insulation on lines, towers, vessels and tanks.

Childers, which manufactures a diversified line of aluminum building products, has grown since 1947 until it is now the largest awning factory in the country. Childers has nationwide distribution, plus export business in Canada, Chile, Germany, Mexico, Switzerland, Cuba, Puerto Rico, and other foreign countries.

Paul Fox Now President of Southern States Iron Roofing

PAUL H. FOX has been elected president of SOUTHERN STATES IRON ROOFING COMPANY, a subsidiary of Reynolds Metals Company and a distributor of sheet metal and other building products with warehouses in 12 southern cities. Fox, who was sales manager for the central region of Reynolds Metals Company, with headquarters in Chicago, will have active direction of the firm.

Koppers Now Expanding Texas & Virginia Plants

KOPPERS COMPANY, INC., is spending in excess of $20,000,000 during 1955 for new plants and equipment, and in enlarging and improving present production facilities.

Of this amount, sizable portions will go into the completion of a large plant at PORT ARTHUR, TEX., to make the popular "squeeze-bottle" plastic, polyethylene, and to completion of a plant at SALEM, VA., for the Company's Wood Preserving Division. The Virginia plant is expected to get into operation late in March while the Texas plant is expected to start production in the third quarter of the year.

William Johns, Jr. Named Rumsey Electric Director

WILLIAM JOHNS, JR., vice-president of the RUMSEY ELECTRIC COMPANY of Philadelphia was recently elected a director of the corporation.

Mr. Johns, a native of Richmond, Virginia, joined Rumsey in 1929, serving as Richmond district manager and regional manager, before being appointed vice-president in 1951. He will continue to make his headquarters in Richmond, Virginia.

Rumsey Electric Company is a direct representative for Allis-Chalmers Manufacturing Company, Delta-Star Electric Company, Lapp Insulator Company and Sangamo Electric Company.

U.S. Hoffman Acquires Hygrade Atlas Sales Rights

THE UNITED STATES HOFFMAN MACHINERY CORPORATION, 105 Fourth Avenue, New York, has acquired the exclusive world-wide sales representation for all HYGRADE ATLAS, INC., products, according to an announcement by Revis L. Stephenson, vice president in charge of Hoffman's Industrial Equipment Division, and Anthony P. Bambara, president of Hygrade Atlas, Simpson, Pennsylvania. The new Hoffman enterprise will be known as the Hygrade Metal Finishing Division.

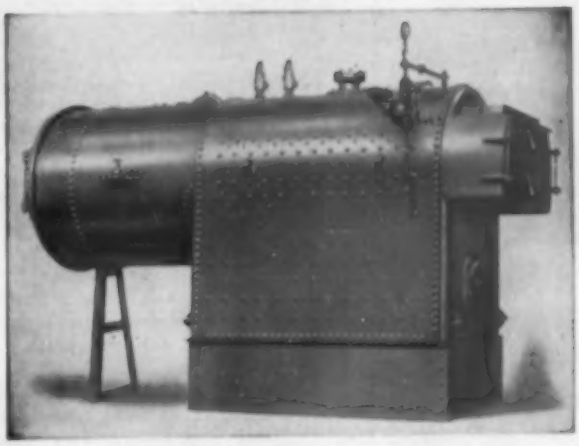
According to the statement, the arrangement was completed in line with the previously announced aims of strengthening the industrial operations of U. S. Hoffman, with an eye toward an expanded sales program of industrial products.

The demands of the heavy metal-working industry for a single responsibility in the design and installation of metal finishing systems were cited as well as the well-established and far-flung industrial sales organization of the Hoffman corporation, as the major reasons for the new agreement.

With the consummation of this contract, the U. S. Hoffman Corporation is now in a position to offer a new line of products allied with, and complementary to, the equipment now manufactured through Hoffman's Industrial Equipment Division. Included in the new line are metal-cleaning, rust-proofing and paint-bonding equipment, as well as drying ovens, electrostatic painting equipment, paint spray booths and paint baking ovens.

All of these products can be furnished either as single units or combined into completely integrated systems with continuous automatic conveyors to meet all necessary production requirements.

POWER
with **POWER** *to spare*



A NEW DOUBLE PASS ALL-PURPOSE INDUSTRIAL AND HEATING BOILER

SOUTHERN MADE FOR SOUTHERN TRADE

Made in sizes from 44 H.P. to 153 H.P. S.B.I. rating with pressure to 150 lbs. Designed for coal, gas or oil firing, the New Lucey Double Pass Boiler can be furnished complete as a package unit.

This boiler is in addition to our regular line of single pass fire box boilers which we have been making since 1918.

WRITE FOR BULLETIN NO. 153 FOR COMPLETE SPECIFICATIONS

LUCEY BOILER
AND MANUFACTURING CORPORATION

CHATTANOOGA, TENNESSEE
1514 CHESTNUT ST. CHATTANOOGA
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Power Consumption And Maintenance Cut

The Slo-Speeds that have been installed on our synchronized dual conveyor system and Solem Sander have resulted in reducing tremendously our maintenance costs as well as power consumption through a reduction of horsepower... the conveyor system, originally designed for two motors, is driven satisfactorily by only one Slo-Speed, and a 2 H.P. Slo-Speed replaced a 5 H.P. motor of another make on the sander, reports E. Douglas Johnson of Higgins, Inc., New Orleans.

STERLING SLO-SPEED

GIVES YOU THE ONE BEST LOW SPEED AND

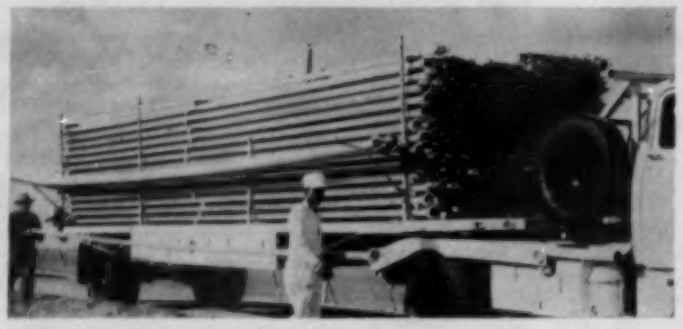
gives uninterrupted service — carries heavy overhung loads — provides versatile mounting and flexibility in arrangement of machinery — saves valuable space — provides greater safety — costs less to install and use. An indispensable source of low speed power for:

Agitators	Dryers	Presses
Blenders	Feeders	Pumps
Blowers	Kilns	Screens
Conveyors	Mills	Tumblers
Cookers	Mixers	Etc., etc.

20-page illustrated catalog... Sterling Speed-Trol, Slo-Speed, Klosd and Klosd-Tite Electric Power Drives. Write for catalog No. 209

STERLING ELECTRIC MOTORS

Plants: New York City 51; Chicago 35; Los Angeles 22; Hamilton, Canada; Santiago, Chile
Offices and distributors in all principal cities



THREE MEN and one truck were able to string and couple a mile of the new aluminum pipe in 1½ hours. Engineers estimate that it takes 10 times that long to lay a mile of steel pipe.

Aluminum Pipe for Temporary Lines—Texas

A DEMONSTRATION held recently in Austin County, Texas, showed that aluminum pipe for temporary oil, gas and water lines can be installed and picked up about 10 times as fast as steel pipe of comparable dimensions. The field demonstration of the laying of aluminum pipe for a temporary gas line to a drilling site showed convincingly that aluminum pipelines, laid on the surface, make possible sizable savings in rig time, transportation and handling of pipe, laying and picking up lines, and other cost factors.

In actual installations a mile of 2⅞" aluminum pipe, used because it is a standard size, was handled by three men and one truck. Average stringing and coupling time was 1½ hours, and average uncoupling and loading time was also 1½ hours. Total man hours were nine hours, and total truck time, three hours.

Engineers estimate that to lay and pick up one mile of steel pipe of comparable dimensions on a temporary line, an average of 98 man hours would be required. Truck time, on the average, would be about six hours.

Seamless, Extruded Pipe

The new development is based upon the use of seamless, extruded aluminum pipe, weighing less than one-eighth as much as steel pipe of comparable dimensions, with a special quick coupling. The coupling device is welded to the ends of the pipe sections to be joined, so that when the coupling is attached in the field, a leak proof fitting is achieved.

The field demonstration was held by REYNOLDS METALS COMPANY, producer of aluminum pipe, at the Dakamount Exploration Corporation's Laura Albert Wiesse et al #1 near Bleiberville, about 65 miles from Houston. Equipment for the installation was from Associated Oil Field Rentals, a Houston firm which purchased an initial shipment of approximately 45 miles of the pipe from RACE & RACE, a Winterhaven, Florida, firm which developed the special coupling used. Reynolds Metals furnishes the seamless, extruded pipe to Race & Race and other firms which add their own coupling devices for quick installation and removal of the temporary lines.

SPECIAL quick coupling, developed by Race & Race of Winterhaven, Florida, provides a leakproof fitting and makes possible rapid installation and picking up of temporary oil, gas and water lines.

Coupling Design

The coupling contains a split "O"-ring gasket on the inside, which seals when the coupling is latched in place. Savings with the aluminum pipe were found to result principally from lighter weight and speed in coupling and uncoupling. A 30-ft joint of the aluminum pipe weighs about 30 lb. Thirty feet of steel pipe of comparable dimensions would weigh more than 200 lb.

Other significant advantages of the new temporary aluminum lines include rig time saved, a greatly increased volume of fluid, fast coupling with no thread maintenance, and lower hauling cost.

Elliott Co.—Kansas City

ELLIOTT COMPANY, Jeannette, Pa., has announced the appointment of O. M. SIEVERT as its Kansas City district manager. Mr. Sievert joined the company in 1944 after graduating from the Missouri School of Mines. After serving two years as an officer in the Navy, he was assigned to the company's Cincinnati office as field engineer. In January 1953 he was transferred to the Kansas City office and became assistant district manager in July of that year.

St. Louis Representative for Strong, Carlisle & Hammond

STRONG, CARLISLE, & HAMMOND COMPANY, Cleveland, Ohio has announced appointment of RHODES EQUIPMENT COMPANY, 4485 Olive Street, St. Louis, Mo. as a direct factory representative for Strong Steam Specialities in that area. The line includes the recently introduced "Hydro-Flex" steam traps, strainers, regulating valves, blowdown valves and other items for power plants.

New Conoflow Representatives in Louisiana and Tennessee

JOHN C. KOCH, vice president in charge of marketing, CONOFLOW CORPORATION, has announced the appointment of two new sales-engineering representatives for Cono Controls.

THE WILLIAMS EQUIPMENT COMPANY, NEW ORLEANS, LOUISIANA, will service southeastern Louisiana and southern Mississppi. R. L. WILLIAMS, principal of the organization, is well known in this area, having been affiliated with the Minneapolis-Honeywell Regulator Company in the capacity of Industrial Branch Manager of their New Orleans office for a number of years.

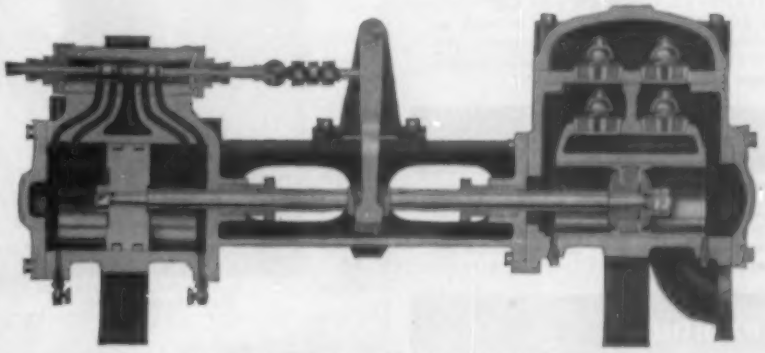
ENGINEERED INSTRUMENT SALES COMPANY with offices in MEMPHIS, TENNESSEE, will cover the western part of Tennessee, the northern half of Mississippi and the eastern portion of Arkansas. JAMES L. SHILANE, president of the company, possesses extensive experience in the fields of instrumentation and automatic control. He has served as executive application and sales engineer for Foote Pierson & Company, Newark, N. J.; chief instrument engineer of the H. K. Ferguson Company, New York, N. Y.; and more recently as head of the instrument design division, Vitro Corporation of America, New York, N. Y.

95% Pumping Cost...

"For FREE"

Via WARREN "Realwear" Horizontal Duplex Steam Pump with Piston Valve Steam Chest

featuring special steam piston ring and steam chest piston valve ring construction, in addition to balanced steam chest piston valves and graphitic iron liners.



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- Oil-free exhaust steam.
- Clean exhaust steam for any purpose.
- Protection of boilers.
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- Economy . . . 95% recovery of fuel cost when exhaust steam utilized.
- Reliability . . . not dependent upon electricity.
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- Elimination of any type lubricator.
- Outside valve adjustment.

This construction can save you money on Boiler Feed and all Steam Processing applications.

WARREN QUIMBY PUMPS

P-41

WARREN PUMPS

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News (continued)

Meyers Heads Louisiana Office of J. J. Finnigan

EARL MEYERS has been appointed sales representative covering LOUISIANA for the J. J. FINNIGAN COMPANY, fabricators of boiler plate for over 65 years. This announcement was recently made by WILLIAM J. MCALPIN, president of the ATLANTA, GEORGIA, concern.

Earl Meyers

A member of the American Society of Heating & Ventilating Engineers, Mr. Meyers, since 1935, has been associated with the manufacturing, distribution and sales of plumbing refrigerator and air conditioning equipment.

The Louisiana office of J. J. Finnigan Company will be located at 5316 Wingate Drive, New Orleans. Other offices are in Little Rock, Dallas, Houston, Jacksonville, Washington, D. C., Charlotte and New York. Main office is located at 722 Marietta Street, N. W., Atlanta.

New Southern Assignments for Chase Brass & Copper

Several major changes in assignments of sales personnel of CHASE BRASS & COPPER CO. (subsidiary of Kennecott Copper Corporation), have been announced by Bruce A. Dean, vice president in charge of sales.

A. REECE HOOKS, JR., succeeds HERMAN H. HERRING as district manager at Atlanta, Georgia, while Mr. Herring is transferred to New Orleans. Mr. Hooks, who has been salesman in the Chase Atlanta district since 1948, is a graduate of Georgia Institute of Technology, has been with Chase since his graduation in 1939, and is well known throughout this territory. Mr. Hooks saw five years' service with the Army Corps of Engineers in World War II, and was honorably discharged with the rank of Major.

JOSEPH M. JOLLEY succeeds JOHN M. GEHL, JR., as district manager in New Orleans, Lousiana. Mr. Gehl will devote his full time hereafter to his responsibilities as southern regional manager, in which capacity he supervises Chase district sales offices and warehouses in HOUSTON, DALLAS, ATLANTA and NEW ORLEANS. Mr. Jolley has been with Chase more than 20 years. For some time he has been salesman in New Orleans and is widely known throughout that territory.

Chase also has announced the establishment of a new district sales office in CHARLOTTE, NORTH CAROLINA, which will service most of North Carolina and South Carolina. HERMAN H. KREMER, formerly connected with the Indianapolis, Indiana, Chase sales district has been appointed district manager. This new district will be added to the southern region and will be under the general supervision of Mr. Gehl. Mr. Kremer was a graduate of Columbia University in 1945 and has been with Chase in various sales capacities since his graduation from college.

Two New Generators for Public Serv. of Oklahoma

THE PUBLIC SERVICE COMPANY OF OKLAHOMA has ordered two 125,000-kilowatt outdoor-type turbine generators, complete with condensers, from the Westinghouse Electric Corporation for installation in Tulsa, Okla.

Because of the normally moderate Oklahoma weather, both turbine-generator units will be weather-proofed so they can be installed outdoors, eliminating the usual covering powerhouse.

The two units will be built with Westinghouse inner-cooled windings and Thermalastic insulation. Magnetic amplifier voltage regulators will be used to control both machines. Both units will be re-heat steam turbines with normal temperature and pressure conditions.

First of the two units is scheduled for shipment in December this year; the second, in December, 1957.

H. Morgan Rogers, Jr. Named V. P. of Lockwood Greene

LOCKWOOD GREENE ENGINEERS, INC. —Engineers—Architects, with offices in Boston, New York and Spartanburg, S. C., recently announced the election of SAMUEL B. LINCOLN as chairman of the board, WILLIAM J. HEISER, president and treasurer, and H. MORGAN ROGERS, JR. as vice president.

Materials Handling Show at Chicago—May 16-20th

The 1955 NATIONAL MATERIALS HANDLING EXPOSITION will be the most comprehensive in the eight-year history of the show, according to Clapp & Poliak, Inc., New York, founders and producers of the event.

More than 200 companies will participate and their displays will cover a vast area of 115,000 sq ft of booth space. This will represent a 15% increase over the indoor exhibit space used in 1951 when the industry last held its exposition in Chicago.

The show will be held during the week of May 16 to 20 in the new exposition hall recently completed as an addition to the International Amphitheatre.

In addition to the show, Clapp & Poliak will revive the custom of staging a Materials Handling Conference concurrently with the exposition to permit visitors to supplement their inspection of machinery with discussions of case histories of materials handling installations in the nation's leading factories and warehouses.

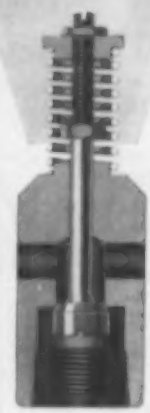
The theme for the show and conference is "The Concept of Obsolescence," selected because it emphasizes the rapid out-moding of handling equipment. Most of the handling devices introduced during the exposition's first year in 1947 are already outmoded because of extremely rapid advances in this new industrial science.

One of the important new aspects of the show will be the emphasis on new systems for handling rather than on particular single types of equipment which characterized previous expositions, according to Saul Poliak, president of the exposition firm.

Conveyors, both portable and permanent, hoists, monorails, cranes, tractors, trailers, hand trucks, portable and permanent elevators, stacking units, railroad car loading equipment, and the like, will be demonstrated under simulated factory conditions.

FOR VACUUM SERVICE

FOSTER Type V VACUUM BREAKERS AND REGULATORS



Foster makes a complete line of spring loaded automatic valves for use in vacuum service — with simple types for protection of stills, heater shells and similar equipment against collapse when cooling down, and more sensitive types for close control of vacuum in manifolds, air lines and vapor lines for various processing requirements.

Like all Foster valves, they are designed and built for long life with minimum maintenance, and are easy to service when it is necessary. Ask for Bulletin V-101.

75

FOSTER ENGINEERING COMPANY

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INDUSTRIAL INSULATION

North service includes maintenance and new construction installation contracts as well as sale of materials for pipe, duct, boiler, and cold storage insulation.

Materials carried to meet all your insulating needs include: Fiberglass coverings and A-E-6 Board, Foamglas pipe coverings and blocks, 85% Magnesia, Mineral Wool, Lion Oil and Laykold weather coat, Foster, Arabol and 3-M adhesives, Kayle High Temp pipe covering and blocks, asbestos cement, Fiberglass Dust-Stop air filters*, Foamglas roof insulation*, new fine fiber low pressure fiberglass pipe covering, and miscellaneous industrial insulation accessories.

*Available but we do not install

"Follow the Compass for the Best in Insulation"

CALL OR WRITE YOUR NEAREST NORTH BROTHERS BRANCH WAREHOUSE FOR OVERNIGHT DELIVERY
IF THE INSULATION YOU WANT IS NOT LISTED—WE HAVE THE EQUIVALENT

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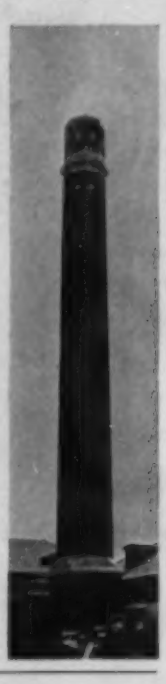

FOR REPLACEMENTS ORDER HIGH PRESSURE

GAGE GLASSES

MAGNIFYING RED LINE

MASTER STANDARD RED LINE & CLEAR
Up to 500 lbs.

MASTER CLEAR & RED LINE EXTRA STRONG
Up to 600 lbs.

Made in Lengths up to 144" Long
And Outside Diameters ⅜", ½", ⅝", ¾", ⅞", 1", 1¼", 1½".

High Pressure Composition

ERNST RUBBER GASKETS

All sizes to fit your gages and valves

FIG. 21—Lip Mold

FIG. 22—Standard

ERNST WATER COLUMN & GAGE CO.
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20—New Brass, 4", flanged motor operated valves at fraction of manufacturer's price. POWER EQUIPMENT COMPANY, 1307 West Main Street, P. O. Box 1-G, Richmond 1, Virginia.

transformers
built to your specifications

Take advantage of our more than 40 years' experience in manufacturing and re-building industrial transformers. Complete satisfaction guaranteed.

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$$$ For Your Ideas

Send your ideas, methods and short-cuts to Southern Power & Industry. Payment is made for suitable material—a photo or rough sketch will make your idea more valuable.

Articles from maintenance and production men in Southern and Southwestern plants are preferred. Material must not have appeared elsewhere nor been sent to another publication.

Swartwout Reorganizes Process Controls Div.

THE SWARTWOUT COMPANY, manufacturer of process control, power plant and industrial ventilation equipment, has announced a complete sales and service reorganization of the company's Autronic process controls division.

Autronic sales to the chemical process and refining industries will be divorced from the company's other divisions. Autronic sales to central stations will continue to be handled by the company's power plant equipment sales force.

A regional product manager is being appointed to head up each of the eight new sales territories. These territories are New York-New England, Philadelphia - East Central, Great Lakes, Midwestern, Southwestern, Southeastern, and West Coast areas.

THE HESLER COMPANY, with headquarters in the Dierks Building, KANSAS CITY, MO., continues as exclusive sales representatives for Swartwout Autronic controls for the entire state of KANSAS and western MISSOURI.

Nothing conveys an impression of quality and prestige more readily than a perfect business card designed by us.

A letter from you will bring an assortment of the business cards we have made for others.

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Peerless Book Form
CARDS

WHAT'S NEW and Where to Get It

FOR FREE INFORMATION—Circle code number on page 17 or 18

O-1 AUTOMATIC STEAM PRESSURE CONTROL—Bulletin 442—Describes the Leslie pressure controller for supplying intermittent make-up to a low pressure system from a high pressure line—positive, faithful.—LESLIE COMPANY, 261 Grant Avenue, Lyndhurst, New Jersey.

O-2 LUBRICATION — Bulletin 103, 4 pages — "Fringe Area Lubrication With Molykote Lubricants"—describes new concepts of extreme pressure or boundary lubrication in which solid lubricants perform a major function. Eleven major types of the company's molybdenum disulfide lubricants are listed and described according to their ingredients, working temperature ranges and method of application. Ten industrial and power plant applications are featured.—THE ALPHA CORPORATION, 65 Harvard Ave., Stamford, Conn.

O-3 STEEL BUILDINGS — Catalog No. 2, 24 pages—Photographs show Star steel buildings in use by specific plants in various industries including warehouses, gins and mill buildings, factories, and many others. Construction details are explained; and building components, estimating data sheet, sample floor plan, and engineering service are covered.—STAR MANUFACTURING COMPANY, 2012 South Stiles, Oklahoma City, Okla.

O-4 EXHAUST FANS — Catalog No. 500-B—Features the S-2 Exhaust Fan; describes various applications, types and construction. Complete dimensional data and capacity tables to assist in selection. Engineering data for standard and long-cone Cyclone Separators included.—FORT WORTH STEEL & MACHINERY CO., Box 1038, Fort Worth 1, Texas.

O-5 STEEL TANKS—Catalog, 52 pages —Gives examples of production and custom steel fabrication offered in storage tanks, fuel tanks, all types of refinery vessels, transport tanks, expanded linepiped anhydrous ammonia systems, and other plant equipment. Extensively illustrated with plant and equipment photographs.—MASTER TANK & WELDING, P. O. Box 5146, Dallas, Texas.

O-6 ELECTRIC HOISTS—Bulletin 618-9-4, 6 pages — Describes electric hoists for big lifts, 4 to 15 ton capacities, featuring load-inching controls and light, compact design. Plant photographs show specific applications of equipment and cutaway view gives construction details and components.—R. G. LeTOURNEAU, P. O. Box 2037, Longview, Texas.

O-7 SOLID FILM LUBRICATION—File Folder — Contains up-to-date and complete answers for solution of difficult lubrication problems due to extreme heat, excessive cold, inaccessibility, high speeds, high loads, galling, seizing, and excessive wear. Describes dry film lubricants.—ELECTROFILM, INC., P. O. Box 166, North Hollywood, Calif.

O-8 MORE PROFITS FROM WELDING—Folder (TIS 2329)—for job and contract welders. Explains how company's metal joining process improves on conventional welding in job shops. Shows wide range of electrodes and explains that this is the reason jobber welders get higher quality bonds on "one chance" repairs where there is no opportunity for experimenting to determine the right filler material.—EUTECTIC WELDING ALLOYS CORPORATION, Flushing 58, New York.

O-9 GRINDING AND POLISHING WITH COATED ABRASIVES—"Production Digest," 60 pages—A varied collection of authoritative papers on coated abrasives grinding and polishing techniques. Manual features 122 photographs, 16 drawings and 4 tables or check lists. Subjects include coated abrasive theory and practice, contour polishing and grinding, contact wheels, abrasive belt lubrication, disc grinding problems, modern use of coated abrasives in wood finishing, and suggestions on cost cutting in production practice. — BEHR-MANNING CORPORATION, Dept. PD-54, Troy, N. Y.

O-10 STAINLESS STEEL FLOOR GRATING—4 page catalog, covers "Weldforged" stainless steel floor grating for the chemical, oil and packing industries. Standard table of safe loads for the stainless steel grating is presented. Non-magnetic grating is rust proof, chemical proof, and offers high heat resistance. — KERRIGAN IRON WORKS, INC., Nashville, Tenn.

O-11 COOLING TOWERS — Bulletin 5.1.902, 4 pages — Describes company's "Le Line," an all new cooling tower designed for air conditioning applications. Tower has the lowest silhouette of any tower of 75 tons capacity or larger. Framework, filling, water distribution system, louvers, wood basin, casing, and mechanical equipment are featured.—J. F. PRITCHARD & CO., 4625 Roanoke Parkway, Kansas City 12, Mo.

O-12 SLING CHAIN DATA BOOK—32 page book is a "how to do it" handbook on sling chains. Sections include "How to Order Sling Chains" and "Care, Use, and Inspection." Booklet has diagrams, charts, and tables on standard and special styles of sling chains and attachments, sizes, weights, and working load limits under many conditions of use.—COLUMBUS McKINNON CHAIN CORP., Tonawanda, New York.

O-13 CLEANING WITH PRESSURE JETS — 2 page bulletin "Faster Cleaning With Pressure Jets" describes boiler tube, gas main, storage tank, cooling coil, processing kettles, and boiler deposit case studies in maintenance cleaning. Bulletin shows how the application of chemical solvents through a jet nozzle under high pressure can clean many deposits in production equipment and pipe lines that are not readily removed by conventional cleaning methods.—DOWELL, INC., Tulsa 1, Okla.

O-14 CHIP HANDLING AND OIL RECLAMATION SYSTEM—8-page catalog containing photographs, drawings, and descriptive data on "how to" handle metal chips and borings, reclaim cutting oil, etc. Actual installations are described and yardsticks provided to permit you to measure the savings. — NATIONAL CONVEYORS COMPANY, INC., 25 Industrial Avenue, Fairview, N. J.

O-15 STEAM CONDENSERS — 24 page catalog describes company's line of steam condensers. Catalog includes sections on installation, engineering, air removal equipment, maintenance, and steam condenser specialties.—CONDENSER SERVICE & ENGINEERING CO., INC., Observer Highway, Hoboken, N. J.

O-16 RUST PREVENTION — Company's new 1955 general catalog No. 254 shows all types of industry how to stop rust. Features 98 color chips of Rust-Oleum products and includes complete instructions for surface preparation and application of products. Applicational photos are used throughout the 24 page book. Two pages are devoted to questions and answers.—RUST-OLEUM CORP., 2799 Oakton St., Evanston, Ill.

O-17 VALVES—64 page catalog, No. 454, lists needle, globe, plug, and check valves. New items listed include a line of plug valves with Teflon plugs that give excellent service in a temperature range—65 to 250 F without the need for a lubricant.—REPUBLIC MANUFACTURING COMPANY, 15655 Brookpark Road, Cleveland 11, Ohio.

A Book You Should Have on **Mechanical Sealing...**

A complete reference catalog on Dura Seal—the engineered mechanical seal that rotates with the shaft. Amply illustrated . . . specific applications . . . installation data. A fact book of real value to designers, operators and maintenance departments.

WRITE FOR DURA SEAL CATALOG NO. 455 SP

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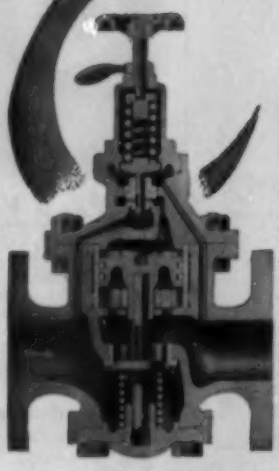

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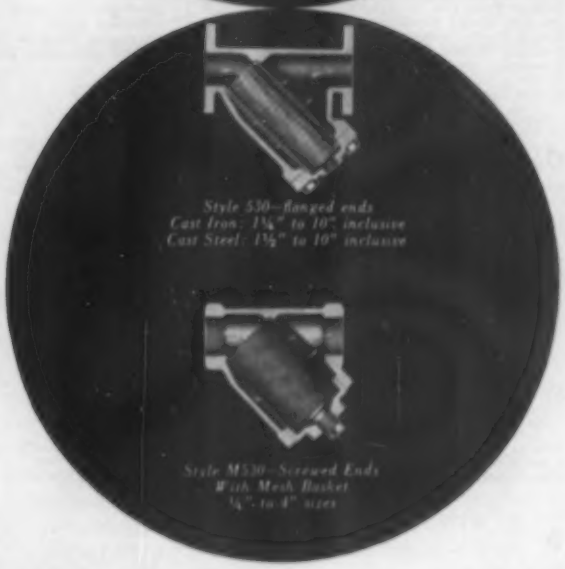

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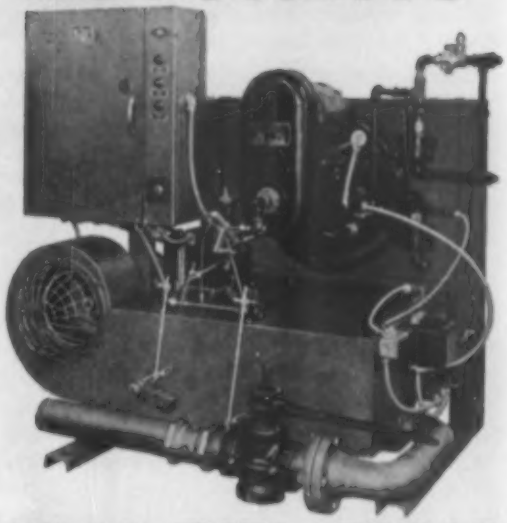

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- √ Maximum efficiencies on BOTH gas and oil.
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- √ Simpler changeover than ever before.
- √ One hundred per cent forced draft.
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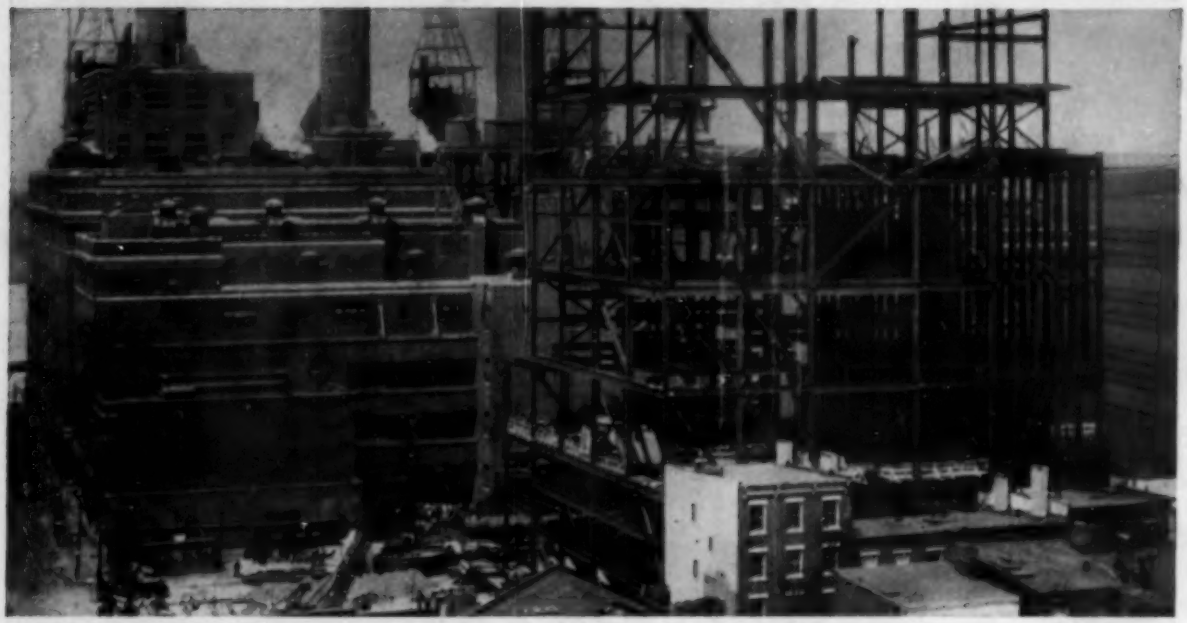

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